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Limestone Road Superfund Site
Cumberland, Maryland

Record of Decision
Operable Unit 2

Prepared by
The U.S. Environmental Protection Agency

June 1996

AR307621

Record of Decision
Limestone Road Superfund Site

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Part 1 - Declaration

1.0 Site Name and Location

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2.0 Statement of Basis and Purpose

This Record of Decision ("ROD") presents the final remedial action selected for Operable Unit 2 ("OU2") of the Limestone Road Superfund Site ("Site"), located in Cumberland, Allegany County, Maryland. This remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §§ 9601 et seq., and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedial action and is based on the Administrative Record for this Site. An index of documents included in the Administrative Record may be found at Appendix A of the ROD.

The Maryland Department of the Environment (MDE) was sent a draft of the ROD on June 5, 1996, and by letter of June 12, 1996, indicated that it had no comments on the ROD. A revised draft of the ROD was sent to MDE on June 20, 1996, along with a request for concurrence on the ROD. The State has verbally indicated a willingness to concur, but wishes to see the final version before doing so in writing.

3.0 Assessment of the Site

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606, that actual or threatened releases of hazardous substances from this Site, as discussed in Section 6.0 (Summary of Site Risks) of Part 2 of this ROD, if not addressed by implementing the remedial action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

4.0 Description of the Selected Remedy

The selected remedy for the Site consists of the following major components:

- Installation of a waterline and ancillary equipment (a pumping station and fire hydrants) to service residents in the vicinity of the Site. The waterline will be of sufficient capacity to meet the needs of both current and reasonably expected future development of the area; and

- Implementation of deed restrictions on the previously capped areas of the Site to prevent use of such areas in such a manner as would cause disturbance of the caps;

- Implementation of a ground water management program to prevent installation of drinking water wells in the vicinity of the Site;

- Continuation of the long term ground water, surface water, and sediment monitoring plans currently being implemented pursuant to OU1;

- Abandonment of existing residential water supply wells.

5.0 Statutory Determination

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site. While EPA considered an alternative that employed treatment as a principal element in order to reduce toxicity, mobility, or volume, this alternative was not considered practicable and was not selected. A five year review for OU2 will be included in the Site-wide five year review that has already been triggered by the start of constuction of the OU1 remedy.

Thomas C. Voltaggio
Director
Hazardous Waste Management Division
Region 3
Environmental Protection Agency

6/28/96
Date

AR307625

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Part 2 - Decision Summary

1.0 Site Name, Location and Description

The Limestone Road Superfund Site is located in Allegany County, Maryland, 2 ½ miles southeast of the city of Cumberland (see Figure 1). The Site includes contamination found on two separate parcels of land: the Diggs Sanitation Company (Diggs) property on the north side of Limestone Road (approximately 20 acres), and the Cumberland Cement and Supply Company (CC&SC) property on the south side of Limestone Road (approximately 190 acres). The Diggs property is bordered on the southwest by several residences and to the northeast by the former Cumberland City Dump (City Dump) and undeveloped land. The CC&SC property is partially bordered on the north by the City Dump and Limestone Road, and undeveloped land on the remaining perimeter of the property. Currently, 18 residences are within a half mile of the Site, five are within 100 yards of the Site and one is located on the Diggs property. These residences are serviced by individual water supply wells.

2.0 Site History and Enforcement Activities

Paul and George Boch reportedly operated a trash collection and burning operation on the Diggs property during the 1960's. In the early 1970's, Diggs Sanitation, Inc. (Diggs), a licensed waste hauler, bought the property and then conducted refuse operations, primarily the landfilling of commercial, residential and demolition waste, until the early 1980's.

The Cumberland Cement and Supply Company (CC&SC) property, which had been the site of a commercial limestone quarrying operation, was purchased by Charles Steiner in 1962 for the purpose of developing the quarry to the north and east of the Site. The quarry, however, was never developed. Instead, ravine areas on the Site were filled during the mid-1970's in order to make a level working area. The fill reportedly consisted of a wide variety of clean construction and demolition debris as well as household trash and commercial and industrial refuse. Activities such as vehicle repair and oil recovery have also reportedly been conducted on the CC&SC property.

In April of 1981, Diggs illegally dumped contaminated waste sludge containing chromium, lead, and cadmium from Fairchild Republic Company (now Fairchild Holding Corp., the successor to Fairchild Industries, Inc., which, in turn, is the successor to Fairchild Republic Company) of Hagerstown, Maryland. It was estimated that 99 tons of that sludge was disposed of on the CC&SC property and 11 tons on the Diggs property. In June 1981, following an initial investigation by the Maryland Department of Health and Mental Hygiene, Diggs Sanitation, Inc. and CC&SC were ordered by the State to clean up their respective properties. The order was challenged by Diggs and CC&SC and reversed; subsequently, new orders were issued to both parties. This action was stayed when EPA became the lead agency for the site. In 1984, a 20,000 gallon tank located in the area of the reported oil recovery operation and the soil surrounding the tank were successfully removed under the supervision of the Maryland Waste Management Administration and the Allegany County Health Department.

In March 1982, EPA conducted a preliminary assessment of the Site which resulted in the proposal for placement of the Site on the Superfund National Priorities List (NPL). In September of 1983, EPA included the Site on the NPL.

In 1986, EPA concluded a Remedial Investigation (RI) and Feasibility Study (FS) for Operable Unit 1 (OU1) at the Site. Based on the findings of these reports, EPA issued an OU1 ROD on September 30, 1986 to address the immediate threats posed by the exposed waste at the Site. The ROD required capping of contaminated soil on both properties and fencing the capped areas. The OU1 ROD also required a Supplemental Remedial Investigation (SRI) and Feasibility Study (SFS) to evaluate the local ground water system and adjacent streams. In February of 1990, EPA and two potentially responsible parties entered into a Partial Consent Decree to conduct the work described in the OU1 ROD. Construction of the fences and low permeability caps for areas on both the Diggs and CC&SC properties began in June 1994 and was completed in November 1994. The supplemental studies were completed in the fall of 1995.

Early findings of the SRI indicated that some local residential wells contained elevated levels of metals, including lead, manganese, copper, and nickel. To address this immediate threat to human health, several Potentially Responsible Parties (PRPs) entered into an Administrative Order on Consent (AOC) in April of 1994 to conduct regular monitoring of residential wells and to provide potable water to residents with elevated levels of contaminants in their wells. At this time, several residents are still receiving bottled water due to elevated levels of contaminants in their wells.

3.0 Scope and Role of Response Action

As with many Superfund sites, the problems at the Limestone Road Site are complex. Thus, the Site has been divided into "Operable Units" (OUs) to simplify the process of addressing these problems. The first OU, OU1, focused on the contaminant source areas. These areas were capped and fenced, as required by the OU1 ROD, in 1994. Operable Unit 2 (OU2) addresses the ground water, surface water, and sediment in the vicinity of the Site based on the SRI and SFS, which studied the contamination in these areas and evaluated alternatives to address it. This ROD addresses OU2 and is the final planned action at the Site.

4.0 Highlights of Community Participation

Pursuant to Section 113(k)(2)(B) of CERCLA, 42 U.S.C. §113(k)(2)(B), the SRI and SFS reports, the Proposed Plan, and other documents relating to OU2 were released to the public for comment on April 15, 1996. These documents were made available to the public in the Administrative Record located in the EPA Docket Room in EPA's Region 3 office, and in the Allegany County Library located in Cumberland, Maryland. The notice of availability of these documents was published in the Cumberland Times-News on April 15 and April 24, 1996.

A public comment period on the documents was held from April 15 until May 14, 1996. EPA held a public meeting in Cumberland on April 24, 1996 during which representatives from both EPA and the State of Maryland answered questions regarding the Site and the Proposed Plan. Responses to the comments received during the public comment period are included in the Responsiveness Summary of this ROD.

5.0 Summary of Site Characteristics

5.1 Site Geology

The Site is located in the Valley and Ridge physiographic province of the Appalachian Highlands. The area is dominated by steeply dipping slopes and ravines and northeast/southwest trending ridges. Relief in the vicinity of the Site is approximately 1,100 feet, ranging in elevation from 590 feet above sea level at the North Branch of the Potomac River to 1,700 feet above sea level at the crest of Irons Mountain. The Site itself is located on the western slope of Irons Mountain. The elevations across the Site range from 660 feet above sea level to approximately 900 feet above sea level. The original topography of the Site has been altered by the landfilling and subsequent capping of the Diggs and CC&SC properties.

During the course of the SRI, the extent of the fill materials requiring capping on both properties was defined. In addition, the geologic and hydrogeologic units were studied. The fill unit consists of a highly variable mixture of brick, glass, concrete, wood, paper, slag, plastic and fly ash in a silt, sand, gravel and clay matrix. The thickness of the fill unit ranged from 0 to 26.4 feet on the CC&SC property and from 0 to 17 feet at the Diggs property. The hydraulic conductivity of the fill materials was measured and found to be approximately 1×10^{-7} cm/sec, much lower than might be expected for fill material.

A 10-foot thick residuum/saprolite unit separates the fill unit from the underlying bedrock. The very low vertical hydraulic conductivity of this unit (less than 1×10^{-8} cm/sec) combined with its thickness, suggests that the unit acts as an barrier that limits the movement of fill unit water into the unsaturated portion of the bedrock. The bedrock unit beneath the Site consists of steeply dipping, fractured shales and siltstones. The major structures within the bedrock which impact ground water flow are horizontal or nearly horizontal fractures, bedding plane fractures, and vertical joints oriented in the direction of the dip of the bedding planes. Short- and long-term pumping tests have shown that the fractures are interconnected; however, the degree of interconnectedness varies across the Site. The general direction of ground water flow in the bedrock unit is in a west-northwest direction, with ground water discharge occurring in Evitts Creek.

5.2 Ground water

Monitoring wells were installed into the fill units on both the Diggs and CC&SC properties. Four volatile organic compounds (VOCs), acetone, benzene, ethylbenzene, and trichloroethene, were detected at low concentrations (less than 15 parts per billion (ppb)) on the Diggs property; none were detected on the CC&SC property. With the exception of nickel, total metals concentrations were generally higher on the Diggs property. The maximum concentrations reported on either property are 1.6 ppb for cadmium, 18.6 ppb for chromium, 20.2 ppb for lead (which exceeds the health advisory level for this metal), 227 ppb for manganese, and 90.8 ppb for nickel.

Twenty-eight bedrock wells were installed and sampled during the SRI. No VOCs were detected in the background monitoring wells or the background residential well. Trichloroethene was detected in three bedrock monitoring wells at concentrations ranging from 0.5 ppb to 1.2 ppb, levels which do not pose a threat to human health. Other VOCs detected in either bedrock wells or residential wells were acetone, chloromethane, 2-butanone, chloroform, ethylbenzene, tetrachloroethane, toluene, and xylene. All were at concentrations below the appropriate Safe Drinking Water Act Maximum Contaminant Level (MCL) or health advisory level.

Metals were found in background, onsite, and residential wells. The maximum concentrations of total metals found in background wells were 2.4 ppb cadmium, 57.2 ppb chromium, 443 ppb lead, 1700 ppb manganese, and 121 ppb nickel. The levels of lead, manganese and nickel are all above MCLs or health advisory levels. Concentrations of total metals exceeded background levels in numerous bedrock monitoring wells; cadmium in three wells, manganese in seven wells, and nickel in five wells. Total cadmium was found in one residential well at 137 ppb, total chromium was found in 11 residential wells at levels ranging from 5 to 9.6 ppb, total lead was found in 13 residential wells at levels ranging from 1.7 to 34.3 ppb, total manganese was found in 20 residential wells at levels ranging from 6.7 to 2,510 ppb, and total nickel was found in 8 residential wells at levels ranging from 12.3 to 100 ppb.

Concentrations of dissolved metals appear in ground water samples in the same relative concentrations as they were detected in the bedrock core samples (manganese is the highest, cadmium the lowest). There is no apparent spatial pattern in the concentrations of the inorganics as a group; each constituent appears in its highest concentration in a different monitoring well. Maximum concentrations of dissolved cadmium, lead, and manganese found in the background wells were 5.3, 1.5, and 525 ppb respectively. Cadmium was not detected above background levels in any bedrock monitoring well or residential well. Chromium was detected above background in four wells, lead in four wells, manganese in 18 wells, and nickel in 13 wells. The maximum concentrations of both total and dissolved metals and the appropriate action levels are shown in Table 1.

The ground water analyses conducted during the SRI have confirmed that trichloroethylene (TCE) and methylene chloride are not contaminants of concern (COCs) at the Site. TCE was detected in only eight of the 52 wells sampled, all at levels below the MCL. Methylene chloride was detected in two residential wells; however, in both cases, it was also detected in blank samples as well, which indicates the chemical was present as a result of the analytical procedure, not actual onsite contamination.

The only inorganics which exceeded MCLs in onsite monitoring wells were cadmium and nickel. The MCL for nickel (in the dissolved samples) was exceeded in four wells. Exceedance of the MCL for cadmium occurred only in a background monitoring well. Although an MCL has not been established for manganese, the high concentrations of this inorganic pose a potential human health risk. Concentrations of manganese appear to be higher in the immediate vicinity of the two landfilled areas. The presence of organic chemical compounds onsite could cause elevated levels of manganese in the ground water. The distribution of dissolved manganese in ground water shows no obvious pattern, most likely because of the fractured bedrock medium. While a traditional plume-like distribution is expected in a fractured medium, the actual distribution is dependent upon the fracture network and the degree to which the rock behaves as a porous medium. Sources of contamination other than the Site may be contributing to the elevated levels of manganese in some residential wells since numerous wells with much lower concentrations are located between the Site and those wells. However, no other specific sources have been identified.

Evaluation of temporal trends shows that the concentrations of all indicators, with the exception of manganese, are generally decreasing or remaining stable. The concentrations of manganese in all wells, including background wells, have shown an increase over time.

5.3 Surface Water and Sediment

The Site is in the drainage basin of the North Branch of the Potomac River (North Branch). Surface water drains from the Site to unnamed tributary streams that flow to the North Branch and Evitts Creek. A spring discharging from the base of the CC&SC property drains to a tributary that flows south/southwest to the North Branch. A spring also discharges from the base of the City Dump and drains to a stream which receives runoff from the City Dump and the Diggs Property and flows into the unnamed tributary above the confluence of Evitts Creek with the North Branch. The capping of the contaminated areas of the Diggs and CC&SC properties has eliminated the contaminated surface runoff; however, the streams still receive groundwater discharge from the bedrock aquifers beneath the Site. In addition, the stream that receives runoff from the Diggs property still receives runoff from the City Dump. While some of the waste on that site has been capped, it is currently being used for salvage operations by the property owner.

Sediment in the two streams which receive surface runoff from the Site have been impacted by Site activities. The sediment in the stream on the CC&SC property exhibits a slightly elevated concentration of chromium at a sampling location near the edge of the Site cap. At the Diggs property, all sampling locations may have been affected by Site conditions. It is difficult, if not impossible, to determine to what degree the contaminants originate from the Diggs and City Dump properties, respectively. Site-related metals found in the stream include chromium, lead, and manganese, all contaminants of concern. These metals have also been found on the City Dump property, which has only been partially capped and which is still used as a salvage yard. Ground water at the City Dump has not been studied and may or may not be contaminated. If it is contaminated, discharge of this water to the creek would be an additional source of contamination to the stream.

In order to assess the impact of the Site on surface water the data from the analyses of the total and dissolved constituents must be reviewed in conjunction with the sediment data. Near the CC&SC property manganese was detected above background in the dissolved analyses at all locations. Manganese was not present above background in the sediment analyses at these locations, however. This suggests that the source of manganese in surface water is ground water rather than surface runoff. (Were the source surface runoff, sediment levels would likely be above background levels as well.) Cadmium and chromium, on the other hand, were reported in total concentrations but were not detected in any dissolved analyses, indicating that surface runoff was the source. Lead and zinc were both reported above background in total and dissolved analyses in the sample taken nearest the Site. However, these samples were collected prior to the capping of this property.

The quality of surface water in the vicinity of the Diggs property is very similar. Near the Diggs property manganese was present above background in the total and dissolved analyses of surface water and in the stream sediments in all locations. Manganese is also present at elevated concentrations in ground water in this area of the Site. Springs occur at two sampling locations, and the presence of manganese in the surface water samples in this area most likely reflects ground water contribution. Zinc, cadmium, and lead were present above background in total analyses of surface water and in sediment analyses near the Diggs property. Cadmium was also present in dissolved analyses of surface water at one location, and zinc at two locations. Again, these samples were collected prior to the capping of this property. Table 2 shows the maximum and average concentrations of metals found in the surface water and sediment as compared to the Biological and Technical Assistance Group (BTAG) screening levels. (These are threshold levels below which adverse impacts to biota are not expected to occur.)

5.4 Fate and Transport

The construction of the caps has effectively eliminated the potential for migration of Site-related contamination via surface water runoff and by air through either volatilization or by entrainment of chemicals absorbed onto particulate matter. The caps have also eliminated the infiltration of precipitation into the fill units. This will reduce the amount of leachate produced over time. Fill unit water leaking vertically through the residuum saprolite unit and into the bedrock aquifer would mix with the ground water and migrate in the general direction of ground water flow (west-northwest). Local residents are currently relying on ground water as a potable water source.

6.0 Summary of Site Risks

The Baseline Risk Assessment (BRA) was prepared as a part of the SRI prior to the start of the OU1 remedial action (i.e., the capping of the landfilled areas) and thus did not consider the impact of these actions on the fate and transport of Site contaminants. Construction of the caps has effectively eliminated the potential for future contamination of the surface water and sediment via runoff; thus, these pathways will not be discussed here.

6.1 Data collection and evaluation

Data from analysis of ground water, surface water and sediments reported in the 1986 RI and the more recent SRI reports were thoroughly examined to evaluate the chemicals present, their distribution and concentrations at the Site. Based upon this review, the data did not demonstrate any clear trends. This is exemplified by the sporadic nature and variability of positive detections for volatiles and inorganics in ground water. Therefore, only the SRI analyses of groundwater, surface water and sediments were used in this BRA as this data is more representative of current site conditions.

Data validation qualifiers were treated according to EPA guidance. Rejected samples ("R" qualifiers) were not included in the database for the risk assessment. Non-detect results ("U" qualifiers) were included only if other results for a given chemical in a particular medium/area indicated the chemical was present. In these instances, half the reported quantitation limit was used. Estimated results, usually indicated by a "J" qualifier, were included in the evaluation. Duplicate samples were averaged and considered as one sample.

Based on Region 3 policy, the exposure point concentrations used in the BRA were calculated based on dissolved inorganics data in monitoring wells and on total inorganics in residential wells.

6.2 Exposure Assessment

There are three basic steps involved in an exposure assessment: 1) identifying the potentially exposed populations, both current and future; 2) determining the pathways by which these populations could be exposed; and 3) quantifying the exposure.

The current and probable future land uses of the Site are critical in identifying current and future potentially exposed populations. Based upon current land use, current zoning and planning, local populations, and future land use plans, residential development is the actual or potential land use for property in the vicinity of the Site. The Site itself is expected to remain undeveloped.

The Site is zoned as a general urban district. Property to the southwest below (downhill of) the Site is zoned for residential use. Due to erosion problems, the steeply sloping wooded land above (uphill of) the Site is a restricted conservation area where no further development will be permitted. Property to the west of the Site slopes steeply down to Evitts Creek. This area is less accessible and would be difficult to develop as residential lots and is likely to remain undeveloped.

For residents living at or near the Site, the primary pathway for exposure to Site-related contaminants is through use of ground water. Homes in the vicinity of the Site obtain drinking water from the local groundwater aquifer through private wells. Due to the rural nature of the area, any new residences would be expected to use this ground water as well. Ground water can release and transport contaminants. Infiltration of precipitation through the soil can potentially leach Site-related contaminants to ground water, although at this Site, the caps should greatly reduce the amount of precipitation reaching the fill material. There is a current and future potential exposure to Site-related contaminants in drinking water wells on and downgradient from the Site. Exposure could occur by consumption of groundwater, dermal contact from household use (i.e. dishwashing, washing cars, laundry, bathing/showering) and inhalation of volatiles while bathing/showering.

Another group of individuals who could be potentially exposed to Site-related contaminants are hikers, hunters and others using the area in the immediate vicinity of the Site for recreational purposes. Evitts Creek is classified as a IV-P surface water which is defined as "recreational trout waters and public water supply". This use designation includes a) holding and supporting adult trout for put-and-take fishing; b) special fishery by periodic stocking and seasonal catching; and c) use as a public water supply. The main stem of the North Branch Potomac River is classified as a I-P surface water which is defined as "water contact recreation, protection of aquatic life and public water supply". This use designation includes a) water contact sports; b) play and leisure time activities where individuals may come in direct contact with surface water; c) fishing; d) the growth and propagation of fish; e) agricultural water supply; f) industrial water supply; and g) public water supply.

The unnamed tributaries of Evitts Creek and the North Branch of the Potomac River receive runoff from the Site as well as the City Dump. Since the construction of the Site caps was completed, contaminated surface runoff was eliminated; however, the streams still receive ground water discharging from beneath the Site. Potential exposure to any contaminants found in surface water could occur during recreational activities by hunters and hikers in unnamed tributaries of Evitts Creek and the North

Branch of the Potomac River. Because of the location of the stream and the nature of the surrounding terrain, it is highly unlikely that unattended small children would play in the area or that adults would bring small children to the area to play. Exposure routes associated with these pathways include incidental ingestion and dermal contact with surface water by adults and small children hiking or hunting in the area. The physical conditions of the unnamed tributaries of Evitts Creek and the North Branch of Potomac River are such that they will not provide a suitable habitat to support a population of sizable game fish. Therefore, ingestion of fish from these streams is not evaluated.

In order to quantify the potential exposure associated with each exposure pathway discussed above, assumptions were made with respect to the various factors used in the calculations. Table 3 summarizes the values used in the BRA.

6.3 Toxicity Assessment

The purpose of the toxicity assessment is to weigh available evidence regarding the potential for particular contaminants to cause adverse effects in exposed individuals. Where possible, the assessment provides a quantitative estimate of the relationship between the extent of exposure to a contaminant and the increased likelihood and/or severity of adverse effects.

A toxicity assessment for contaminants found at a Superfund site is generally accomplished in two steps: 1) hazard identification; and 2) dose-response assessment. Hazard identification is the process of determining whether exposure to a contaminant can cause an increase in the incidence of a particular adverse health effect (e.g., cancer or birth defects) and whether the adverse health effect is likely to occur in humans. It involves characterizing the nature and strength of the evidence of causation.

Dose-response evaluation is the process of quantitatively evaluating the toxicity information and characterizing the relationship between the dose of the contaminant administered or received and the incidence of adverse health effects in the administered population. From this quantitative dose-response relationship, toxicity values (e.g., reference doses and slope factors) are derived that can be used to estimate the incidence of or potential for adverse effects as a function of human exposure to the contaminant. These toxicity values are used in the risk characterization step to estimate the likelihood of adverse effects occurring in humans at different exposure levels. For the purpose of the BRA, contaminants were classified into two groups: potential carcinogens and noncarcinogens. The risks posed by these two types of compounds are assessed differently because noncarcinogens generally exhibit a threshold dose below which no adverse effects occur, while no such threshold has been proven to exist for most carcinogens. As used here, the term carcinogen means any chemical for which there is sufficient evidence that exposure may result in continuing uncontrolled cell division (cancer) in humans and/or animals. Conversely, the term noncarcinogen means any chemical for which the carcinogenic evidence is negative or insufficient.

Slope factors have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic contaminants of concern. Slope factors, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper-bound" reflects the conservative estimate of the risks calculated from the slope factor. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Slope factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). Slope factors used in the BRA for contaminants found at the Site are presented in Table 4.

Reference doses (RfDs) have been developed by EPA to indicate the potential for adverse health effects from exposure to contaminants of concern exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of contaminants of concern from human epidemiological studies or animal studies to which uncertainty factors have been applied account for the use of animal data to predict effects on humans. Reference doses used in the BRA for contaminants of concern are presented in Table 4.

6.4 Human Health Effects

The contaminants of concern for this Site were determined to be arsenic, cadmium, copper, manganese, nickel, and zinc. The following discussion of the human health effects of each of these contaminants is summarized from the BRA.

<u>Arsenic</u>

Arsenic is a naturally occurring element that can be present in a number of different valence states and as a constituent of both inorganic and organic compounds. It occurs most often as a sulfide in a variety of complex minerals containing copper, lead, iron, nickel, cobalt, and other metals. Most of the arsenical compounds are used in the production of agricultural chemicals such as insecticides, herbicides, algicides, and growth stimulants for plants and animals. In certain areas, concentrations in soil may be elevated because of naturally high levels in mineral deposits in the area.

The fate of arsenic in water depends upon the chemical form of the arsenic and on interactions with other materials present. Soluble forms move with water, and may be carried long distances through rivers. However, arsenic may be adsorbed from water onto sediments, especially clays, iron oxides, aluminum hydroxides, manganese compounds and organic material. Bioconcentration of arsenic occurs in aquatic organisms, primarily in algae and lower invertebrates. Biomagnification in aquatic food chains does not appear to be significant. There is no evidence that photolysis and volatilization are important removal mechanisms of arsenic in the aquatic environment. Although arsenic minerals and compounds are readily soluble, migration of arsenic through soil is greatly limited due to the strong sorption by clays, hydroxides, and organic matter.

Acute oral poisoning in humans may result in gastrointestinal disturbances (nausea, vomiting and diarrhea), hemolysis and encephalopathy following very high doses. In most cases, effects are seen only after chronic low-dose exposures, whether environmental or occupational. These disorders have been linked to exposure to drinking water containing greater than 50 grams of Arsenic per liter of water. Higher exposures to inorganic arsenic related to arsenical poisoning or industrial exposures can also cause characteristic skin lesions, dark and light patches, and small corns on heavily cornified skin such as palms and soles of feet.

Arsenic has been classified by EPA as a Group A - Human Carcinogen. This is based on reports of increased cancer incidence from inhalation and drinking water exposures.

<u>Cadmium</u>

Cadmium is present generally throughout the environment and in many materials. Elevated concentrations are generally related to non-ferrous mining and refining. It is used in steel manufacturing and in pigments for plastics. Cadmium concentrations in soil are increased by the application of sewage sludge and phosphate fertilizers. Long-term exposure to excessive cadmium causes adverse kidney effects and effects on calcium metabolism. An association has been shown between occupational exposure and an increased incidence of lung and prostate cancer in workers. Teratogenic effects have been observed in test animals after very high doses.

Cadmium is classed as a B1 carcinogen (some evidence in humans and adequate evidence in animal studies) only by inhalation.

Copper

Copper occurs naturally as sulfides, oxides and carbonates. Sulfide ores constitute 75 percent of the total copper production. Approximately half of all copper production is used in electrical equipment. Another common use for copper is in plumbing and heating equipment. Copper salts also function as pesticides for fungi or algae and as herbicides.

Copper is an essential element and forms part of several enzymes. The daily requirement is about 2 mg for adult humans. The daily intake of copper ranges from 2 to 5 mg/day and comes from common food stuff which contain up to 10 mg/kg.

By inhalation, copper is a respiratory irritant. Occupational exposure to copper dust via inhalation has resulted in mucosal irritation of the mouth, eyes, and nose; anorexia; nausea; and occasional diarrhea by factory workers. Accidental exposure to large amounts of copper can cause gastrointestinal disturbances including vomiting, diarrhea, nausea, abdominal pain and metallic taste in the mouth. Copper fumes can cause irritation of the respiratory tract otherwise known as metal fume fever, a reversible flu-like response. The drinking water limits (secondary MCL of 1 mg/L and MCL of 1.3 mg/L) are based on adverse tastes and potential health risks, respectively.

Manganese

Manganese is widely distributed and found naturally as oxides, carbonates and silicates. It is used in metallurgy, chemical manufacture, tanning, textile bleaching and welding rods. It is added as a trace element in fertilizers for certain crops. Manganese is an essential trace element in the diet, but deficiencies have not been reported. Manganese is neurotoxic at adequate dose levels; neurological disorders are well-documented via the inhalation route by workers.

The general public is primarily exposed to manganese by ingestion of foods and water or inadvertent ingestion of soil. Very little information is available concerning manganese poisoning by the oral route. Dermal exposure has not been noted as a concern except in the case of potassium permanganate which may cause severe irritation or is corrosive when it contacts skin or mucous membrane.

Nickel

Agricultural soils, world-wide, contain from 3 to 1000 mg/kg nickel. Nickel is found in many foods and the average daily intake in the U.S.A. is reported to be from 300 to 500 mg. Less than 10 percent of the ingested inorganic nickel is adsorbed from the digestive tract. Nickel has been shown to be an essential element in the diet of some animal species but this has not been proven for the human species. Large oral doses are tolerated by animals and systemic effects from oral ingestion are unlikely. Nickel can cause pulmonary inflammation and dermal contact has caused dermatitis in nickel workers.

Nickel is classified as a known human carcinogen via inhalation (Group A) by USEPA and the oral RfD for soluble salts is 0.02 mg/kg/day.

Zinc

Zinc concentration in soils varies from 10 to 300 mg/kg. Zinc is found in foods, particularly those high in protein. Zinc is an essential element, necessary for the function of various enzymes. Fifteen mg/day has been recommended as the daily requirement for adults by the National Academy of Scientists Food and Nutrition Board. Chronic poisoning from zinc ingestion has not been described in humans. Zinc is not a suspected carcinogen.

6.5 Risk Characterization

The risk characterization process integrates the toxicity and exposure assessments into a quantitative expression of risk. For carcinogens, the exposure point concentrations and exposure factors discussed earlier are mathematically combined to generate a chronic daily intake value that is averaged over a lifetime (i.e., 70 years). This intake value is then multiplied by the toxicity value for the contaminant (i.e., the slope factor) to generate the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the contaminant. These probabilities are generally expressed in scientific notation (e.g., 1.0×10^{-6}, otherwise expressed as 1E-6). An excess lifetime cancer risk of 1.0×10^{-6} indicates that, as a reasonable maximum estimate, an individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under specific exposure conditions at a site. The generally acceptable excess cancer risk range, as defined by Section 300.430 (e)(2)(I)(A)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.430 (e)(2)(I)(A)(2), is between 1.0×10^{-4} and 1.0×10^{-6}.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (i.e., the chronic daily intake) with the toxicity of the contaminant for a similar time period (i.e., the reference dose). The ratio of exposure to toxicity is called a hazard quotient. A Hazard Index (HI) is generated by adding the appropriate hazard quotients for contaminants to which a given population may reasonably be exposed. Any media with an HI greater than 1.0 has the potential to adversely affect health.

Under a current residential use scenario it was found that the Site did not pose an unacceptable carcinogenic risk. The carcinogenic risk was between 1×10^{-4} and 1×10^{-6} in all but one monitoring well, where it exceeded 1×10^{-4}. The carcinogenic risk is driven primarily by arsenic; however, the levels of arsenic are below the MCL even in the well that exceeded the acceptable risk level. Furthermore, it is not clear that the arsenic is Site-related. Under this same scenario, it was found that the Hazard Index exceeded 1 for many residential and onsite wells. The elevated Hazard Index values were primarily driven by manganese. The risk posed by the Site indicates that remedial action is warranted to address the ground water contaminated by manganese and to prevent future exposure. Table 5 shows the maximum calculated cancer risks and hazard indices for both onsite and offsite wells, using both the average concentrations detected and the maximum concentrations detected.

Elevated levels of lead found in the drinking water of several residences has also been of concern. Several exceedances of EPA's action level for lead (15 ppb) have been detected. The source(s) of the lead have not been determined. Potential sources of lead are both contamination from the Site and residential plumbing.

No unacceptable levels of risk were associated with the recreational use of the area in the vicinity of the Site.

The ecological risk assessment showed that there are elevated levels of contaminants in adjacent streams. Prior to the construction of the Site caps, the streams received runoff from the fill areas. These past discharges may have left areas of contamination in the stream sediment that could be a continuing source of contaminants to the environment. Also, ground water currently flowing beneath the Site still reaches the streams and is a potential continued source of contamination.

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

7.0 Description of Alternatives

The SFS Report discusses the alternatives evaluated for the Site and provides supporting information relating to the alternatives presented in this ROD.

7.1 Alternatives Considered

The alternatives considered for the OU2 are as follows:

1. No Action
2. Home Treatment Units, Monitoring, and Institutional Controls
3. Waterline, Monitoring, and Institutional Controls
4. Pump and Treat, Waterline, Monitoring, and Institutional Controls

Alternative 1: No Action

Estimated Capital Costs: $0
Estimated Annual O&M Costs: $0
Estimated Present-Worth Costs: $0

The NCP requires that EPA consider a no action alternative for every site to establish a baseline for comparison to alternatives that do require action. This alternative assumes that the measures currently being undertaken as a part of the OU1 Interim Remedial Action called for in the September, 1986 ROD would continue, but no additional actions would be taken. These measures include periodic inspection of the landfill caps, ground water monitoring, and surface water monitoring. There would be no additional costs associated with the No Action alternative.

Common Elements of Alternatives 2 through 4

The three additional alternatives analyzed contain several common elements. These common elements are necessary to monitor and/or prevent unacceptable risks posed to human health and the environment. These elements include:

- institutional controls;
- ground water monitoring; and
- ecological monitoring.

Description and Purpose of each Common Element

- *Institutional controls*: The length of time necessary to return the ground water to natural conditions (if this is possible) cannot be determined. Therefore, institutional controls will be used to prevent the use of contaminated ground water and installation of additional wells into the contaminated aquifer. These controls will take the form of deed restrictions and the use of a ground water management zone in the vicinity of the Site. The deed restrictions will also prevent future use of the land in such a way as to potentially expose the fill material.

- *Ground water monitoring*: The ground water monitoring program currently being implemented at the Site pursuant to the OU1 ROD will continue. This monitoring program currently consists of the collection of samples from onsite and offsite monitoring wells on a quarterly basis and will be modified as necessary and appropriate based on yearly reviews of the monitoring data.

- *Ecological monitoring*: The surface water and sediment monitoring program currently being implemented at the Site pursuant to the OU1 ROD will continue. This monitoring program currently consists of the collection of samples from streams receiving ground water discharge and surface water runoff from both the Diggs and CC&SC properties on a quarterly basis. This program, like the ground water monitoring program, will be modified as necessary and appropriate based on yearly reviews of the data.

Alternative 2 - Home Treatment Units plus Common Elements

Estimated Capital Costs: $268,000
Estimated Annual O&M Costs: $34,000
Estimated Present-Worth Costs: $608,000
Time to Implement: Less than one year

In-home treatment of residential well water would be provided through the use of individual units such as ion exchange systems. These home treatment units would be installed on the water supply line from the well to treat water to be used for domestic purposes. Any expended resin cartridges would require either onsite regeneration or disposal. In addition to the ground water monitoring program described under "Common Elements," quarterly monitoring of residential wells would also be required.

The cost estimate for this alternative assumes that 19 residences would need home treatment units. This is a conservative assumption; results from recent home well monitoring suggest that fewer than half of the residences would in fact need units.

With the completion of the Site caps required under OU1, it is expected that levels of contaminants will slowly dissipate to background levels and that ground water could eventually be available for beneficial use. Monitoring of onsite and offsite wells, including residential wells, will track ground water contaminant levels for up to 30 years to ensure that contaminant levels do not increase.

Alternative 3 - Waterline plus Common Elements

Estimated Capital Costs: $683,000
Estimated Annual O&M Costs: $19,000
Estimated Present-Worth Costs: $873,000
Time to implement: Approximately one year

A waterline would be installed to provide an alternative water supply to the 19 residents along Limestone Road. Specific remedial activities include the installation of approximately 2,800 feet of 6-inch diameter watermain, one booster pumping station, five fire hydrants, and 19 house connections, as well as the abandonment of 19 residential wells. The proposed alignment of the watermain is shown on Figure 2.

With the completion of the Site caps required under OU1, it is expected that levels of contaminants will slowly dissipate to background levels and that ground water could eventually be available for beneficial use. Monitoring of onsite and offsite wells will track ground water contaminant levels for up to 30 years to ensure that contaminant levels do not increase.

Alternative 4 - Pump and Treat, Waterline, plus Common Elements

Estimated Capital Costs: $1,766,500
Estimated Annual O&M Costs: $300,000
Estimated Present-Worth Costs: $4,766,500
Time to Implement: One to two years

This alternative includes all of the elements of Alternative 3, plus the installation of five to ten groundwater extraction wells around the downgradient perimeter of the Site, performance of limited pumping tests on each extraction well, construction of a pump station above each extraction well location, installation of buried forcemains to convey extracted ground water to a central on-Site treatment facility, construction of a ground water treatment facility, construction of a gravity main to convey treated ground water from the treatment facility to the drainage swale on the Diggs property and any drainage improvements required to convey the treated water to Evitts Creek, and long-term discharge monitoring. Ground water treatment would continue until the aquifer has been restored to beneficial use. For cost estimation purposes, operation and maintenance of the system was assumed to continue for thirty years.

Home treatment units were ruled out as a part of a pump and treat option because it is likely that the ground water extraction would dry up or severely limit the production of residential wells.

8.0 Summary of Comparative Analysis of Alternatives

The remedial action alternatives described above were evaluated using the following criteria, as required under Section 300.430(e)(9)(iii) of the NCP, 40 C.F.R. § 300.430(e)(9)(iii):

Threshold Criteria: Statutory requirements that each alternative must satisfy in order to be eligible for selection.

1. *Overall Protection of Human Health and the Environment* - Evaluation of the ability of each alternative to provide adequate protection of human health and the environment in the long and short-term and of how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with Applicable or Relevant and Appropriate Requirements* (ARARs) - Evaluation of the ability of each alternative to attain applicable or relevant and appropriate requirements under federal environmental laws and state environmental or facility siting laws or provide grounds for invoking a waiver established under CERCLA.

Primary Balancing Criteria: Technical criteria upon which the detailed analysis of the alternatives is primarily based.

3. *Long-Term Effectiveness and Permanence* - Evaluation of expected residual risk and the ability of each alternative to maintain reliable protection of human health and the environment over time after cleanup requirements have been met.

4. *Reduction of Toxicity, Mobility, or Volume through Treatment* - Evaluation of the degree to which an alternative employs treatment methods to reduce the toxicity, mobility or volume of hazardous substances at the Site.

5. *Short-Term Effectiveness* - Evaluation of the period of time needed for each alternative to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period.

6. *Implementability* - Evaluation of the technical and administrative feasibility of each alternative, including the availability of materials and services.

7. *Cost* - Section 121 of CERCLA, 42 U.S.C. § 9621, requires selection of a cost-effective remedy that protects human health and the environment and meets the other requirements of the statute. Alternatives are compared using present worth cost, which includes all capital costs and the operation and maintenance costs incurred over the life of the project. Capital costs include expenditures necessary to implement a remedial action (e.g., construction costs). All costs presented are estimates calculated for comparison purposes only.

Modifying Criteria: Criteria considered throughout the development of the preferred remedial alternative and formally assessed after the public comment period, which may modify the preferred alternative.

8. *State Acceptance* - Assessment of technical and administrative issues and concerns that the State may have regarding each alternative.

9. *Community Acceptance* - Assessment of issues and concerns the public may have regarding each alternative based on a review of public comments received on the Administrative Record and the Proposed Plan.

8.1 Overall Protection of Human Health and the Environment

Alternative 1 (No Action) contains no provisions for preventing exposure to contamination and is not protective of human health and the environment. Because Alternative 1 does not meet this threshold criteria, it will not be evaluated further.

The common elements in Alternatives 2, 3, and 4 include monitoring and institutional controls to ensure that the alternatives are protective of human health and the environment. Institutional controls will restrict the potential for use of contaminated ground water. Ground water monitoring will track ground water contaminant levels and monitor the effectiveness of the Site clean-up. The ecological monitoring will ensure that Site-related contamination does not pose unacceptable environmental risks.

In Alternatives 2, 3, and 4, either a waterline or home treatment units will remove the potential current and future exposure of local residents to Site-related contaminants. Therefore, Alternatives 2, 3, and 4 are considered equally protective of human health. The pump and treat system considered under Alternative 4 would reduce the amount of Site-related contamination reaching both the ground water and the stream, decreasing the threats to both.

8.2 Compliance with ARARs

The Federal and State requirements or criteria that a Superfund remedy must comply with are called **Applicable or Relevant and Appropriate Requirements** (ARARs). In this section of the ROD, EPA has identified certain ARARs which the alternatives must meet. The ARAR for Alternative 2 follows:

40 C.F.R. Part 141	Safe Drinking Water Act	Establishes Maximum Contaminant Levels (MCLs) and non-zero Maximum Contaminant Level Goals (MCLGs)that would be allowed to remain in ground water used for drinking water; applies to water that has been treated by the home treatment units.
40 C.F.R. Parts 260-270; COMAR 26.13	Standards for Generation, Treatment, Storage or Disposal of Hazardous Waste	Establishes standards for the handling of hazardous waste; applies to wastes which may be generated by the home treatment units.

In addition, 40 C.F.R. Part 268 may be applicable if residues generated by the home treatment units are land disposal restricted wastes.

The ARARs for Alternative 3 are as follows:

40 C.F.R. Part 141	Safe Drinking Water Act	Establishes Maximum Contaminant Levels (MCLs) and non-zero Maximum Contaminant Level Goals (MCLGs)that would be allowed to remain in ground water used for drinking water; applies to water delivered by the public water supply line.

Code of Maryland Regulations (COMAR) 26.04.04	Well Construction	Includes requirements for construction and abandonment of wells.

The ARARs for Alternative 4 include those which are pertinent to Alternative 3, plus the following:

16 U.S.C. 661-667e	Fish and Wildlife Coordination Act	Coordinates Federal, State, public, and private organizations in protecting fish, wildlife, and their habitats.
40 C.F.R. Part 261 COMAR 26.13.02	Identification and Listing of Hazardous Waste	Establishes the criteria for determining if a solid waste exhibits the characteristics of toxicity, ignitability, corrosivity, or reactivity or is a listed waste; applies to waste generated during the ground water treatment process.
40 C.F.R. Part 262 COMAR 26.13.03	Standards Applicable to Generators of Hazardous Waste	Establishes requirements for a generator who treats, stores or disposes of hazardous waste onsite; applies to waste generated during the ground water treatment process.
40 C.F.R. Part 263 COMAR 26.13.04	Standards Applicable to Transporters of Hazardous Waste	Establishes standards which apply to persons transporting hazardous waste within the State if the transportation requires a manifest under COMAR 26.13.03; applies to offsite transport of waste generated during the ground water treatment process.
40 C.F.R. Part 264 COMAR 26.13.05	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	Establishes minimum State standards which define the acceptable management of hazardous waste; applies to operation of the ground water treatment plant.

40 C.F.R. Part 268	Land Disposal Restrictions	Restrictions on land disposal and certain storage of land disposal restricted wastes which may be generated by the treatment of contaminated ground water.
COMAR 26.08.01	Maryland Water Pollution Control Regulations	Establishes Best Practicable Control Technology Currently Available as the requirement for water pollution control; applies to treatment of ground water.
COMAR 26.08.02	Maryland Water Quality Regulations	Establishes designated uses of the waters of the State and sets water quality criteria based on protection of these uses; applies to discharge of treated ground water.
COMAR 26.08.03	Maryland Discharge Regulations	Establishes discharge limitations for point source discharges to surface water; applies to discharge of treated ground water.
33 U.S.C.A. §1342 COMAR 26.08.04	Clean Water Act Maryland Discharge Permits	Establishes requirements for issuance of permits for water discharge; substantive (but not administrative) requirements apply to discharge of treated ground water.

8.3 Long-term Effectiveness and Permanence

The Site caps are expected to reduce the impacts of Site contamination to the ground water, surface water and sediment. The monitoring provisions of the common elements will track any changes in ground water quality over time. The land use restrictions will prevent any disturbance of the caps that could reduce their effectiveness or cause a release of the contaminated fill material beneath them.

Alternative 2 (Home Treatment Units) provides an immediate supply of safe drinking water to those residences that are impacted by the Site. The reliability and effectiveness of the home treatment units will depend on consistent ground water monitoring and adequate maintenance of the units. This option would require a greater degree of regular monitoring and maintenance than the other alternatives to ensure the continued protection of human health.

Alternative 3 (Waterline) provides a permanent, safe and reliable water supply to all currently impacted residences, as well as those that may be impacted in the future. This alternative would not require the regular monitoring of residential wells or maintenance of the treatment units as would Alternative 2, and thus is a more reliable source of safe drinking water.

Alternative 4 (Pump and Treat, Waterline) would result in the removal and treatment of Site-related contaminated groundwater from beneath the Site, and therefore, may provide greater overall effectiveness than either a waterline or home treatment units. Furthermore, pumping and treating the ground water would reduce the amount of contamination leaving the Site and impacting the stream.

8.4 Reduction of Toxicity, Mobility or Volume through Treatment

Alternative 4 is the only alternative that has the potential to reduce the volume of contaminated ground water at the Site, as it is the only alternative that includes active treatment to reduce the contaminant levels at the source area. However, because of the fractured bedrock, it would be difficult to implement a program that would effectively capture and treat the contaminated ground water. In addition, the caps installed over the contaminated areas during the OU1 Interim Remedial Action are expected to reduce the levels of contaminated ground water leaving the Site over time.

8.5 Short-term Effectiveness

Because the monitoring provisions of the common elements are a continuation of actions already being taken pursuant to the OU1 ROD, no additional construction or start up period would be necessary. The deed restrictions could be implemented in less than one year.

Installation of home treatment units (Alternative 2) would be easier and quicker than the construction of a waterline or a pump and treat system. While the design of a waterline could take some time, the actual construction of the waterline (Alternatives 3 and 4) would only require a few months. In the interim, the PRPs are required, under the terms of the April 1994 AOC, to provide residences with excessive levels of Site contaminants in their well water with bottled drinking water until the selected remedial action has been fully implemented. Thus, the impacted residences would not be at risk during the time required to construct any of the alternatives.

The design and construction of the pump and treat system included in Alternative 4 would likely take up to one year longer than the design and construction of the water line. Because this construction work would take place onsite, the only additional risk to the community would be posed by the increased traffic in the vicinity of the Site. The risk to workers would occur primarily during the installation of the extraction wells through potential contact with contaminated ground water. The workers could be protected from any potential hazards through a properly implemented and enforced health and safety plan.

8.6 Implementability

Because the monitoring provisions of the common elements are a continuation of actions already being taken pursuant to the OU1 ROD, implementability is not an issue. Because the Site owners are PRPs, it is expected that they will agree to implement deed restrictions on the Site properties.

Under Alternative 2, the use of home-treatment units is technically feasible, as the equipment is readily available. Long-term maintenance of the systems would be required in order to ensure that the units remain effective. This type of maintenance may be difficult to implement over the assumed 30-year O&M period. Any expended resin cartridges (or other waste products) from each unit would require regeneration or disposal, possibly as a hazardous waste.

There are no foreseeable implementability concerns for Alternative 3. This alternative employs standard construction techniques and demonstrated and reliable technologies.

Implementation of the ground water pump and treat portion of Alternative 4 may not be feasible for a number of reasons. Because there is no clearly discernable contaminant plume, it would be difficult to properly locate the extraction wells. It is questionable whether an extraction system could be designed which would effectively contain or capture Site-related contaminants since their distribution is not clear. In addition, the pumping of water at the Site could mobilize contaminants from other sources, including the City Dump, which is located adjacent to the Site. Also, metal sludge generated during the treatment process would require temporary onsite storage in compliance with 40 C.F.R. Parts 264 and 268 and eventual offsite disposal.

8.7 Cost

The estimated present worth cost of Alternative 2 (home treatment units) is $608,000. Based on verbal quotations received from vendors, the capital cost (equipment and installation) would be approximately $268,000 for 19 units. It was assumed that over the next 30 years, one replacement unit would be required at each location. O&M costs would be approximately $34,000 annually.

The estimated present worth cost of Alternative 3 (waterline) is $873,400. This includes a capital cost $683,000, and O&M costs of approximately $19,000 annually.

The estimated present worth cost for Alternative 4 (pump and treat and waterline) is $4,766,500. The capital cost of $1,766,500 includes the waterline, the pump and treat system, a water treatment plant, and a discharge line. The annual O&M costs will be approximately $300,000.

8.8 State Acceptance

The Maryland Department of the Environment (MDE) was sent a draft of the ROD on June 5, 1996, and by letter of June 12, 1996, indicated that it had no comments on the ROD. A revised draft of the ROD was sent to MDE on June 20, 1996, along with a request for concurrence on the ROD. The State has verbally indicated a willingness to concur, but wishes to see the final version before doing so in writing.

8.9 Community Acceptance

A public comment period on the Proposed Plan was held from April 15 to May 14, 1996 and a public meeting was held to discuss the plan and the SRI and SRS on April 24, 1996, as described in Section 3 of this ROD. As shown in the Responsiveness Summary section, the comments received during the meeting were supportive of EPA's preferred remedy. Letters received from local officials during the public comment period were also supportive of the remedy.

9.0 Selected Remedy and Performance Standards

After consideration of the requirements of CERCLA, the detailed analysis of the alternatives using the nine criteria, and public comments, EPA has determined that Alternative 3, Waterline plus Common Elements, is the most appropriate remedy for the Limestone Road Superfund Site. This alternative meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs, and provides the best balance of long-term effectiveness and permanence, reduction of toxicity, mobility or volume of contaminants through treatment, short-term effectiveness, implementability, and cost.

The selected remedy consists of the following major components:

- Installation of a waterline and ancillary equipment (a pumping station and fire hydrants) to service residents in the vicinity of the Site. The waterline will be of sufficient capacity to meet the needs of both current and reasonably expected future development of the area; and

- Implementation of deed restrictions on the previously capped areas of the Site to prevent use of such areas in such a manner as would cause disturbance of the caps;

- Implementation of a ground water management program to prevent installation of drinking water wells in the vicinity of the Site;

- Continuation of the long term ground water, surface water, and sediment monitoring plans currently being implemented pursuant to the ROD for OU1;

- Abandonment of existing residential water supply wells.

The proposed alignment of the waterline is shown in Figure 2.

10.0 Statutory Determinations

EPA's primary responsibility at Superfund sites is to select remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA, 42 U.S.C. § 9621, establishes several other statutory requirements and preferences. These requirements and preferences specify that, when complete, the selected remedial action for a site must comply with applicable or relevant and appropriate requirements established under Federal and State environmental laws, unless a statutory waiver is justified. The selected remedy must also be cost-effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The statute also expresses a preference for remedies that employ treatment as a principal element.

10.1 Protection of Human Health and the Environment

The selected remedy for the Site will provide adequate protection of human health and the environment as follows: the institutional controls will prevent the future use of the landfilled areas such that the integrity of the caps would be compromised, thus preventing direct contact with the fill material, and would prevent the installation of a drinking water well into the fill area; the ground water, surface water and sediment monitoring will track what are expected to be decreasing levels of contaminants in these media (due to the site caps); and the waterline will provide safe drinking water for area residents, eliminating their reliance on ground water for a drinking water supply.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

Under Section 121(d) of CERCLA, 42 U.S.C. § 9621(d) and EPA guidance, remedial actions at Superfund sites must attain legally applicable or relevant and appropriate Federal and State environmental standards, requirements, criteria, and limitations (collectively referred to as ARARs). Applicable requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address hazardous material found at the site, the remedial action to be implemented at the site, the location of the site, or other circumstances at the site. Relevant and appropriate requirements are those which, while not directly applicable to the site, nevertheless address problems or situations sufficiently similar to those encountered at the site that their use is well suited to that site.

The selected remedy will comply with all applicable or relevant and appropriate requirements. These ARARs are presented in Section 8.2 (Compliance with ARARs).

10.3 Cost-Effectiveness

Section 300.430(f)(1)(ii)(D) of the NCP, 40 C.F.R. § 300.430(f)(1)(ii)(D), requires EPA to evaluate cost-effectiveness by first determining if the alternative satisfies the threshold criteria: protection of human health and the environment and compliance with ARARs. The effectiveness of the alternative is then determined by evaluating the following three of the five balancing criteria: long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, and short-term effectiveness. EPA has determined that the selected remedy will satisfy the threshold criteria and most effectively address the threats presented by contaminated ground water at the Site. The estimated present worth costs are $873,000. The selected remedy is cost effective because the cost is proportional to the overall effectiveness as compared to the other alternatives that were considered.

10.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a cost-effective manner at the Site. The waterline will provide a permanent source of safe drinking water to the residents living in the vicinity of the Site. While pumping and treatment of the contaminated ground water was considered, this alternative was not selected because the effectiveness of such a system is highly questionable due to the nature of the impacted aquifer (fractured bedrock). Also, the system could possibly exacerbate the problem by pulling contaminants from another local source (the City Dump). Finally, the caps installed during the OU1 Interim Remedial Action are expected to reduce impact of the Site on the ground water and surface water over time.

10.5 Preference for Treatment as a Principal Element

There are no treatment technologies in the selected remedy. As discussed in Section 10.4, treatment was not considered practicable at this Site due to the nature of the contaminated media and the expectation that the caps will reduce the Site impacts to ground water and surface water over time. These impacts will continue to be monitored as a part of this selected remedy.

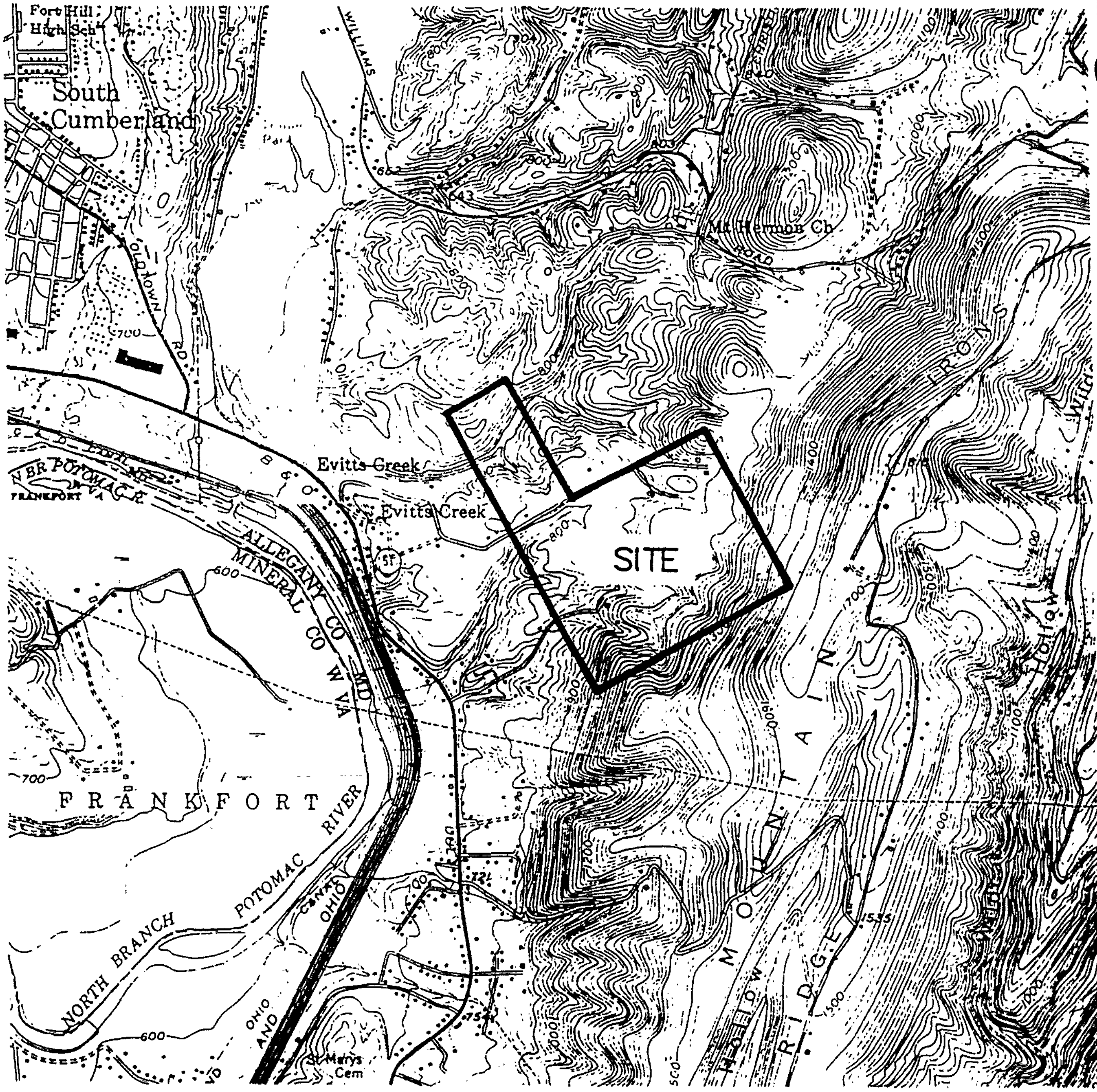
11.0 Documentation of Significant Changes

EPA issued the Proposed Remedial Action Plan for OU2 of this Site for public review and comment on April 15, 1996, and held a public meeting to discuss the plan on April 24, 1996. The local community, including the local public officials, were supportive of the then proposed (now selected) remedy identified by EPA.

EPA received three letters containing comments during the comment period. Two were from local officials and were again supportive of EPA's plan. The third letter was from Conestoga-Rovers & Associates (CRA), a firm that has served as the prime contractor for the PRPs during the SRI and the interim remedial action. EPA agreed with many of the comments in the letter, which are addressed in the Responsiveness Summary section of this ROD.

Among other things, CRA commented on the monitoring provisions of the proposed plan. Specifically, EPA's proposed plan called for quarterly monitoring of ground water, surface water and sediment for both organic and inorganic contaminants, as well as bioassays. CRA suggested that the extant interim monitoring plan, which currently includes quarterly monitoring of these same media for inorganics, was adequate to meet the needs of the project since the contaminants of concern, as identified in the SRI and presented in the ROD, are inorganics. EPA agrees, and has modified the selected remedy accordingly.

Figure 1



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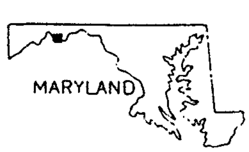


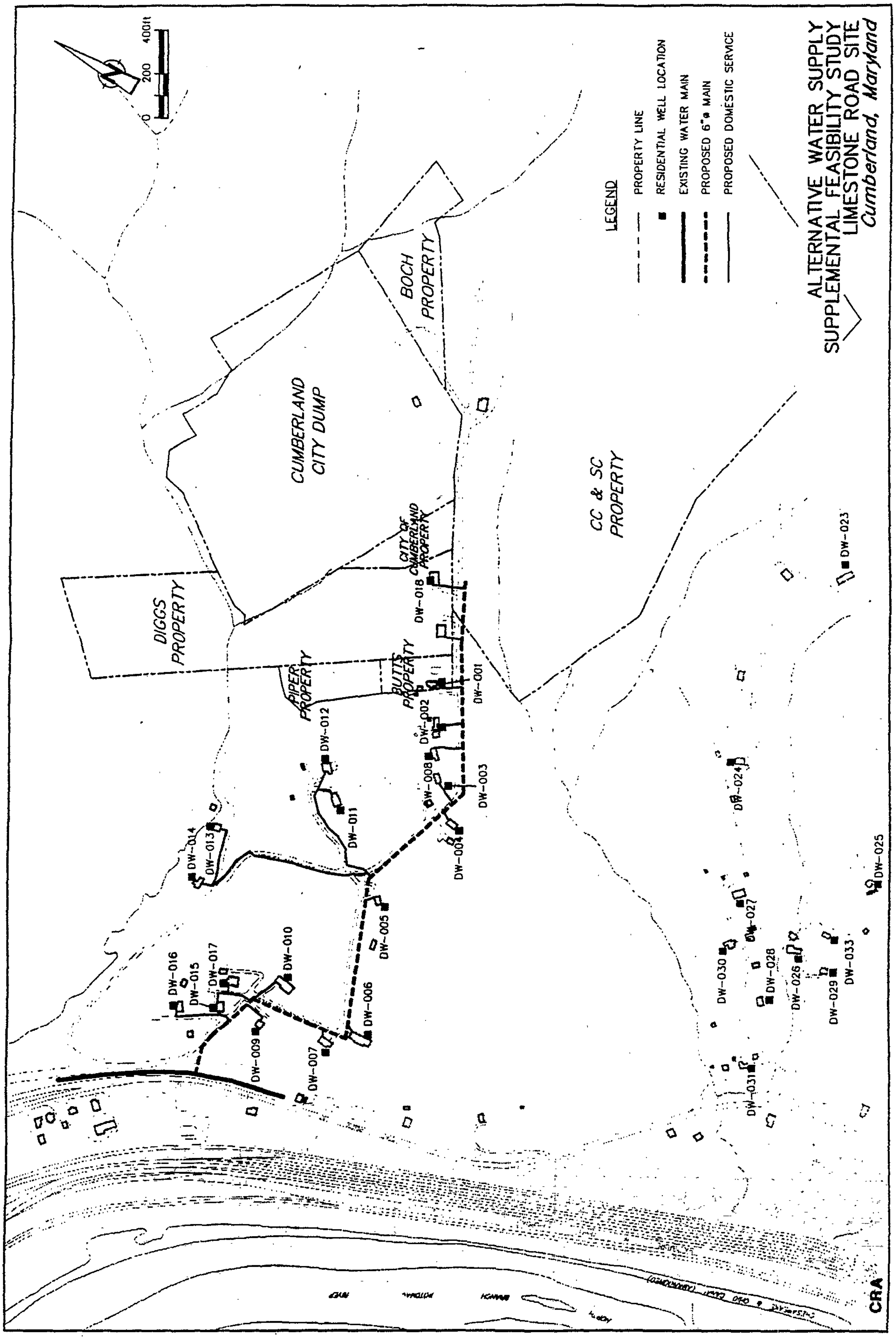
QUADRANGLE LOCATION

SITE LOCATION MAP
LIMESTONE ROAD SITE SRI
Cumberland, Maryland

CRA

AR307655

Figure 2



AR307656

Table 1
Concentrations of Total and Dissolved Metals in Site Monitoring Wells Compared to MCLs and Risk-Based Concentrations (RBCs)
values in ug/l

Metal	Range, dissolved	Range, total	RBC	MCL
Aluminum	n.d. - 1080	n.d. - 4760	11,000	-
Arsenic	n.d. - 31.6	n.d. - 230	0.045	50
Barium	10.6 - 441	n.d. - 934	2600	2,000
Beryllium	n.d. - 0.31	n.d. - 1.7	0.02	4
Cadmium	n.d. - 3.3	n.d. - 10.0	18	5
Calcium	2870 - 394,000	3610 - 420,000	-	-
Chromium	n.d. - 27.9	n.d. - 144	180	100
Cobalt	n.d. - 40	n.d. - 152	2200	-
Copper	n.d. - 7.3	n.d. - 287	1500	1300
Iron	n.d. - 45,000	n.d. - 191,000	-	-
Lead	n.d. - 10.1	n.d. - 504	-	15
Magnesium	n.d. - 186,000	n.d. - 165,000	-	-
Manganese	17.5 - 3050	6.8 - 37,000	800	-
Mercury	n.d. - 0.15	n.d. - 0.4	37	2
Nickel	n.d. - 180	n.d. - 328	730	100
Potassium	543 - 35,200	n.d. - 32,900	-	-
Silver	n.d. - 5.5	n.d. - 6.9	18	50
Sodium	17,100 - 1,800,000	12,000 - 2,390,000	-	-
Thallium	n.d. - 1.3	n.d.	2.9	2
Vanadium	n.d. - 2.5	n.d. - 54	260	-
Zinc	n.d. - 332	n.d. - 1520	11000	-

n.d. = not detected

Table 2
Concentrations of Metals in Site Surface water and Sediment compared to BTAG screening levels (Flora/Fauna)

Metal	Surface Water Range, dissolved	Surface water Range, total	BTAG Screening Level	Sediment Range	BTAG Screening Level
Aluminum	n.d. - 20,200	n.a.	460/200	1600 - 33,000	- / -
Arsenic	n.d. - 4.4	n.d.	- /874	n.d. - 38	- /8,200
Barium	n.d. - 330	n.d. - 197	- /10,000	84 - 626	- / -
Beryllium	n.d. - 31	n.a.	100,000/5.3	n.d. - 3.8	- / -
Cadmium	n.d. - 44	n.d. - 1.3	1.1/0.15	n.d. - 80	676/ -
Calcium	26,500 - 351,000	39,900 - 294,000	- / -	n.d. - 63,000	- / -
Chromium	n.d. - 58	n.d.	- /210	n.d. - 90	5/260,000
Cobalt	n.d. - 151	n.a.	- / -	n.d. - 160	- / -
Copper	n.d. - 50	n.d. - 9.1	- /6.5	n.d. - 136	- /34,000
Hex. Cr.	n.d. - 0.05	n.a.	2/1	n.d. - 0.08	- /<81,000
Iron	n.d. - 39,000	n.d. - 112	- /320	5750 - 66,500	- / -
Lead	n.d. - 86	n.d. - 2.9	- /1	13.4 - 220	- /46,700
Magnesium	4350 - 177,000	4790 - 118,000	- / -	n.d. - 10,000	- / -
Manganese	n.d. - 86,200	n.d. - 103	- / -	n.d. - 178,000	- / -
Mercury	n.d. - 40	n.a.	- /0.012	n.d. - 0.21	- /150
Nickel	n.d. - 4000	n.d. - 15.7	- /14.77	n.d. - 729	- /20,900
Potassium	n.d. - 224,000	1900 - 207,000	- / -	n.d. - 5000	- / -
Selenium	n.d. - 5.2	n.d.	522/3	n.d. - 1.4	- / -
Silver	n.d. - 18,000	n.a.	1.9/0.0001	n.d. - 4.9	- /733
Sodium	n.d. - 1,000,000	1960 - 516,000	- / -	n.d. - 10,500	- / -
Thallium	n.d. - 70	n.a.	- /40	n.d.	- / -
Vanadium	n.d.	n.a.	- /<10.0	n.d. - 50	- / -
Zinc	n.d. - 15,500	n.d. - 982	110/110	24 - 31,900	- /150,00

n.d. = not detected
n.a. = not analyzed

Table 3 - Exposure Assumptions
Ground water ingestion scenario
Average and Maximum expected exposures

Variable	Value, Child		Value, Adult	
	Average	Maximum	Average	Maximum
Chemical Concentration	mean	maximum	mean	maximum
Ingestion rate (liters/day)	1	1	2	2
Body weight (kilograms)	15	15	70	70
Exposure frequency (days/year)	350	350	350	350
Exposure duration - carcinogen (years)	10	30*	10	30
Exposure duration - noncarcinogen (years)	1*	1*	1*	1*
Averaging time - carcinogen (years x days)*	25550	25550	25550	25550
Averaging time - noncarcinogen (years x days)*	365	365	365	365

*These values are non-standard for EPA-approved risk assessments; however, they do not change the net result of the risk assessment.

Table 4 - Cancer Potency Slopes and Reference Doses (RfDs) for Contaminants of Concern (COCs)

COC	Cancer Potency Slope $(mg/kg/day)^{-1}$	RfD (mg/kg-day)
Arsenic	1.5	3.00×10^{-4}
Cadmium	n.c.	5.00×10^{-4}
Copper	n.c.	3.70×10^{-2}
Manganese	n.c.	2.40×10^{-2}
Nickel	n.c.	2.00×10^{-2}
Zinc	n.c.	3.00×10^{-1}

n.c. = non-carcinogen

Table 5 - Maximum Cancer Risk and Hazard Indices

	Cancer Risk	Hazard Index
Onsite wells - average concentration	3.11×10^{-4}	8.06
Onsite wells - maximum concentration	7.94×10^{-4}	8.48
Offsite wells - average concentration	2.34×10^{-5}	7.39
Offsite wells - maximum concentration	9.04×10^{-5}	19.2

- Cancer risk is, in all cases, driven by arsenic, which does not exceed the Maximum Contaminant Level (MCL).
- Except for the "offsite wells - maximum concentration," hazard indices are driven by manganese; in this case, it is driven by cadmium, which exceeds the MCL.

AR307660

Part 3 - Responsiveness Summary

This Responsiveness Summary documents public comments expressed to EPA on the Proposed Remedial Action Plan for OU2 of the Limestone Road Superfund Site and EPA's responses to those comments. The information is organized as follows:

A. Overview
B. Comments Received During the Public Meeting
C. Written Comments Received During the Comment Period

A. Overview

EPA held a public comment period from April 15 through May 14, 1996, to receive comments from the public on the Supplemental Remedial Investigation and Supplemental Feasibility Study (SRI and SFS) reports and the Proposed Remedial Action Plan ("Proposed Plan") for OU2 of the Limestone Road Superfund Site. EPA held a public meeting on April 24, 1996 at 7:00 at the District 16 Fire Hall in Cumberland, Maryland. The public meeting was attended by EPA and Maryland Department of the Environment (MDE) staff, local residents, public officials, and representatives and consultants of the Potentially Responsible Parties (PRPs). The transcript from the public meeting is in the Administrative Record for the Site.

The purpose of the meeting was to present and discuss the findings of the SRI/SFS and to apprise the meeting participants of EPA's preferred remedial alternative for OU2. Comments received during the meeting and written comments received throughout the public comment period are presented below, along with EPA's response.

B. Comment Received During the Public Meeting

1. A community member asked how EPA would select the final alternative to address the ground water.

EPA RESPONSE: EPA relies on public input during the clean-up process so that the remedy for each Superfund site meets the needs and concerns of the local community. EPA has, in the past, reviewed public input and recommendations on a proposed clean-up remedy and changed that remedy to address the community's concerns. EPA will review all of the comments received from the community during the public meeting and those submitted in writing during the public comment period. After reviewing these comments, EPA will select a final alternative and announce this selection in a document called a Record of Decision. In addition, EPA will place a public notice in the *Cumberland Times News* to inform the community of the Record of Decision. EPA may also produce a brief fact sheet highlighting the selected remedy and send the fact sheet to each person on the Site mailing list.

2. A community member asked who will pay for the cost of constructing the proposed waterline or any of the proposed remedies.

EPA RESPONSE: Once EPA selects its final alternative, EPA will negotiate with the PRPs to pay for the costs of the remedy including the construction, maintenance, and initial hook-up to the existing residences. If EPA is unsuccessful in coming to an agreement with the PRPs, then money from the Superfund trust fund may be used to pay for the selected remedy. If money is used from the trust fund, EPA will continue to pursue the PRPs to recover the money spent on implementing the selected remedy.

3. A community member asked EPA to identify the PRPs at the Site.

EPA RESPONSE: EPA has identified Joseph and Patricia Diggs, Fairchild Industries, Cumberland Cement and Supply Company, and Kelly Springfield Tire Company as the PRPs at the Limestone Road Site. These parties, with the exception of Joseph and Patricia Diggs, have entered into agreements with EPA to perform work at the Site, including capping and fencing the landfilled areas, supplying bottled water to local residents, and conducting the supplemental groundwater and stream studies.

4. A community member asked why parties responsible for Site contamination are identified by EPA as only potentially responsible.

EPA RESPONSE: The CERCLA statute provides the definition of a PRP. They are considered to be "potentially responsible" until such time as their liability is established by a court of law.

5. A community member asked how EPA identifies parties responsible for contamination and how they are involved in the cleanup.

EPA RESPONSE: CERCLA §107 identifies four categories of individuals or organizations that are responsible parties: current site owners or operators; owners or operators of the site at the time hazardous substances were disposed of at the site; certain persons who arranged for treatment or disposal of hazardous substances at the site; and certain persons who transported hazardous substances to the site. EPA attempts to compel these parties to perform or pay the costs associated with the cleanup at a site. However, some parties are financially unable to provide support to the cleanup, so EPA will use money from the Superfund trust fund, which is established through a tax on the chemical and petroleum industries, to pay for the costs associated with the cleanup.

6. A community member asked if EPA's final decision on a selected remedy depends on the willingness of the PRPs to pay for implementing the remedy.

EPA RESPONSE: EPA's final decision on a selected remedy does not depend on the willingness of the PRPs to pay for implementing the remedy. However, the NCP requires EPA to consider the cost effectiveness of a proposed remedy. If the PRPs choose not pay for the remedy, EPA may pay for the remedy using Superfund trust monies and pursue the PRPs through court action to recover the costs for the remedy. EPA may also issue an order to the PRPs requiring them to implement the remedy.

7. A community member asked where the proposed waterline would be placed, what size it would be, and how far it would extend.

EPA RESPONSE: The proposed waterline is in the conceptual stages and has yet to be designed. If EPA selects the waterline alternative, the location, size, and length will be addressed during the design stage. Currently, there is an existing water main located on Route 51 that could be used to connect a waterline to provide service for the residents in the Site area.

8. A community member asked how long it would take to install the proposed waterline if Alternative 3 is selected as the remedy.

EPA RESPONSE: Once EPA selects a final remedy, the Agency will attempt to negotiate with the PRPs to conduct the work needed to implement the selected remedy. This work will include preparing the designs and specifications and constructing and implementing the selected remedy. EPA estimates that construction will be completed in approximately two years.

9. A community member asked if local residents will be responsible for any of the costs associated with installing the proposed waterline.

EPA RESPONSE: Local residents and community members will not be responsible for any of the costs associated with constructing or installing the proposed waterline. EPA will negotiate the costs with the PRPs or utilize the Superfund trust monies to cover the costs of constructing and installing the proposed waterline. However, residents will be responsible for paying future bills for water service.

10. A community member asked if installing a sewage system is included as part of the waterline alternatives in the Proposed Plan.

EPA RESPONSE: A sewage system is not included in EPA's proposed waterline alternatives at the Site. Any information on installing a sewage system would be handled by local government and not EPA.

11. A community member asked about the projected costs for installing the proposed waterline.

EPA RESPONSE: The current projected cost of the proposed waterline work, including constructing, installing, and monitoring, is $875,000.00.

12. A community member asked if the proposed waterline will be large enough to service more than the 19 houses listed in the Proposed Plan.

EPA RESPONSE: The size of the proposed waterline will be addressed and determined during the design stage of the project. Areas that are currently impacted by the Site or may be impacted in the future will be included in the area to be serviced.

13. A community member asked if the American Legion property (baseball field) would be included in the hook-up to the proposed waterline.

EPA RESPONSE: The proposed waterline will be designed to have a capacity to provide service to the entire Site area, including this property.

14. A community member asked EPA to explain the deed restrictions on the landfill properties that are listed under Alternative 3 in the Proposed Plan.

EPA RESPONSE: The deed restrictions that are listed under Alternative 3 are designed to prevent someone from installing a well through the landfill caps, building a structure on top of the landfill caps, or using ground water affected by contamination at the Site.

15. A community member asked if the residential wells will be capped in EPA's recommended alternative and if well water can be used to water lawns and wash cars.

EPA RESPONSE: In order to prevent future exposure to contaminated ground water, EPA's selected remedy includes capping the residential wells once the water line is in place. Therefore, once the remedy is installed, residents would not have access to the well water for use on their lawns or cars.

16. A community member asked what contaminants are currently in the ground water and whether EPA found contamination in Evitts Creek or the Potomac River.

EPA RESPONSE: Sampling results revealed elevated levels of nickel, manganese, and cadmium in the ground water. In addition, slightly elevated levels of lead were detected; however, it is not known if the lead is present as a result of the Site or residential plumbing. Sampling results from Evitts Creek revealed elevated levels of nickel, manganese, lead, chromium, cadmium, and zinc. Because of the size of the Potomac River, any contamination migrating from the Site to the Potomac River would not be detectable because of dilution. Therefore, EPA did not sample the water in the Potomac River.

17. A community member commented on the inconsistency of contamination showing up in their wells and asked if EPA will continue to sample and monitor the residential wells for contamination until the selected remedy is implemented.

EPA RESPONSE: The PRPs, under the direction of EPA, continue to test a number of residential wells in an effort to monitor the type and amount of contamination in the Site area. The sampling will continue if necessary until the waterline is in place.

18. A community member commented that a local resident was taken off of bottled water because sampling showed that contaminants, which were once present in the resident's well, were no longer detected. The community member asked what criteria EPA uses to determine whether residences can be taken off the bottled water supply.

EPA RESPONSE: EPA identified certain criteria and health-based levels for contamination in the 1994 Administrative Order on Consent with the PRPs. Residential wells were sampled for one year, and if the data indicated that the wells were not, in fact, contaminated, the resident was taken off bottled water.

19. A community member asked if there are any potential risks associated with currently using contaminated well water to water lawns or wash cars.

EPA RESPONSE: The risk posed by the contaminants in the ground water is through direct, long-term ingestion. In addition, the contaminants remain in the water and do not dissipate into the air. Therefore, the contaminated ground water does not pose any short-term risks when used to water lawns or wash cars.

20. A community member commented that a house is currently under construction near the Site. The community member asked if EPA would provide bottled water to that residence once it is completed or would the homeowner need to have a well installed and sampled to determine if that well is contaminated.

EPA RESPONSE: EPA can not determine if the ground water in that area is contaminated without installing a well. However, if a well is installed at this property and sampling indicates that the water is contaminated, bottled water would be provided to that residence pursuant to the AOC.

21. A community member asked about the type of waste dumped at the Site and if the waste posed an immediate danger to the community.

EPA RESPONSE: A majority of the waste at the Site is residential and industrial debris and trash. However, some hazardous wastes, including chromium, lead, and cadmium, were disposed on both properties of the Site. These contaminants pose a risk to human health and the environment through long-term direct contact or direct exposure (ingestion). The cap and fencing previously installed will prevent direct contact with the contaminants and the alternate water supply will prevent direct exposure to the contaminants.

22. A community member asked if the contaminants at the Site could get into the air and endanger the local residents who live immediately near the Site.

EPA RESPONSE: The exposed wastes at the Site have been capped, thereby preventing the possibility of the contaminants becoming airborne.

23. A community member asked EPA to explain how they capped the exposed waste and asked how long the caps will last.

EPA RESPONSE: The cap consists of four layers. The first layer above the landfill is a soil base; the second layer is a synthetic liner; the third layer is a drainage layer, and the final layer is a two-foot layer of soil. The cap prevents water from coming in contact with the waste and reduces the spreading of contamination off-site. In addition, fences were erected around the capped areas. The cap will be evaluated on a regular basis to ensure that it maintains its effectiveness. Currently, the PRPs are maintaining the cap, sampling the ground water every three months, and performing inspections of the cap to ensure that there is no significant erosion. The PRP's activities are closely monitored by EPA and the State of Maryland.

C. Written Comments Received During the Comment Period

EPA received three letters of comment during the public comment period for the Proposed Plan; two were from local officials, and the third was from Conestoga-Rovers and Associates (CRA), prime contractor to the PRPs.

1. The first letter received was from the Allegany County Health Department. In addition to supporting the selected remedy, the Department also requested that three comments become a part of the Site record:

1.) Connection to a newly constructed public water supply must be mandated by regulation or local code home rule ordinance; and

2.) After connection to the public water supply, all domestic groundwater supplies (e.g., wells) formerly serving these residents must be abandoned and sealed in conformance with Code of Maryland Regulations 26.04.04 - Well Construction; and

3.) All tap connections to the public supply must be inspected by the appropriate County authority. Similarly, severance of connections from former groundwater supplies must be inspected to eliminate any possibilities of cross-contamination.

EPA Response: All written comments are included in the Administrative Record for the Site

2. The second letter received was from the Allegany County Department of Public Works. In addition to supporting the proposed remedy, the County asked that EPA consider a currently planned water supply project "as the solution to the Limestone Road Site rather than proceeding to have the PRPs provide the water system."

EPA Response: EPA will keep the County's willingness and proven ability to provide public water service in mind when planning the implementation of the selected remedy.

3. The final letter received was from CRA. They, too "agree that USEPA's proposed remedial action . . . is the most appropriate remedial action of those [presented in the Proposed Plan] in light of the conditions at the Site." Additional comments are summarized below:

A. CRA discusses the change in Reference Dose (RfD) for manganese between the time the SRI and risk assessment were completed and the time the Proposed Plan was prepared, and recommends the new RfD be used in the preparation of the ROD.

EPA Response: The hazard index values presented in the Proposed Plan do reflect the new RfD; it was used in preparation of the ROD, as well.

B. CRA suggests the Proposed Plan was misleading in that it didn't mention that the streams near the Site "also would receive runoff from other properties which are likely to contribute contaminants (e.g., the City Dump)."

EPA Response: The City Dump is not a part of the Superfund Site and thus was not discussed in detail in either the Proposed Plan or this ROD. EPA agrees that the City Dump has contributed and may still contribute contaminants to the tributary to Evitts Creek, which also flows by the Diggs Property.

C. CRA suggests that the Proposed Plan was misleading regarding the presence of lead in residential wells, stating that currently, only one residential well has shown an exceedance of the EPA Action Level.

EPA Response: While CRA's statement is correct regarding recent sampling, data from the OU1 RI/FS show lead in residential wells at levels of up to 134 ppb.

D. CRA discusses in detail the differences between the monitoring requirements of the various alternatives and the associated differences in cost associated with the requirements and suggests these differences are not taken into account in the Propose Plan. For example, Alternative 2 would require substantially more residential well monitoring than Alternatives 3 or 4 because under those alternatives, residential wells would be abandoned, thus, the monitoring costs associated with Alternative 2 would be higher than those associated with Alternatives 3 and 4.

EPA Response: These differences were, in fact, taken into account in the cost estimates presented in both the Proposed Plan and this ROD.

E. CRA suggests that the groundwater "monitoring program for the remedial action should build upon the existing [Interim Monitoring Program], and not commence with up to five years of quarterly sampling as proposed in the Proposed Plan." They further maintain that there is no need for surface water and sediment monitoring at the Site because the caps have eliminated the potential for contaminants to migrate to the streams via surface runoff.

EPA Response: Upon further consideration, EPA agrees that it is appropriate for the monitoring provisions of this ROD to mirror those currently required under the Interim Monitoring Program and has altered the provisions of the Proposed Plan accordingly. The issue of continued monitoring of the stream will be revisited when the current years' monitoring data are reviewed.

F. CRA states that Alternative 3 "could be implemented in the shortest time frame," and further suggests that because "(t)he design and installation of waterlines are standard civil engineering practices . . . Detailed review of this component of the remedial action by the USEPA, the Army Corps of Engineers, or USEPA's oversight contractor would not be necessary."

EPA Response: EPA does not agree that Alternative 3 could be implemented in the shortest time frame; it would be more expeditious to provide home treatment units to local residents (as provided for under Alternative 2). However, the estimated time difference for implementation between those two alternatives is months and residents with elevated levels of contaminants in their wells would continue receiving bottled water during this period. EPA does agree, however, that the design and installation of a waterline is a standard civil engineering practice and will take a streamlined approach to the oversight of this work, should the PRPs agree to undertake it.

G. CRA and the Settlors suggested that EPA include in the ROD language to the effect that under the pump and treat scheme proposed under Alternative 4, "capture of contaminants by pumping from the aquifer would be difficult due to the fractured nature of the bedrock aquifer. Therefore, Alternative 4 may not be reliable over the long term."

EPA Response: EPA generally agrees with this statement. See Section 8.6 of the Decision Summary.

LIMESTONE ROAD OU2
ADMINISTRATIVE RECORD FILE * **
INDEX OF DOCUMENTS

II. REMEDIAL ENFORCEMENT PLANNING

1. Complaint, In the United States District Court for the District of Maryland, United States of America, Plaintiff, v. Fairchild Industries, Inc. and Cumberland Cement and Supply Co., Defendant, (undated). P. 200001-200011.

2. Partial Consent Decree, In the United States District Court for the District of Maryland; Civil Action No. R-88-2933; United States of America, et al., Plaintiffs; v. Fairchild Industries, Inc. and Cumberland Cement and Supply Co., Defendants, (undated). P. 200012-200071.

3. Letter to Mr. Tracy Getz, Winston & Strawn, from Ms. Cynthia Nadolski, U.S. EPA, re: Interpretation of the language in the Partial Consent Decree describing the procedures EPA uses to approve or disapprove of plans, reports, or proposals, 1/23/92. P. 200072-200073.

4. Letter to Mr. Danald [sic] Rose from Mr. S. Andrew Sochanski, U.S. EPA, re: Consent for Access or Right of Entry to Mr. Rose's property, 1/31/92. P. 200074-200074.

5. Letter to Mrs. Viola Piper from Mr. S. Andrew Sochanski, U.S. EPA, re: Consent for Access or Right of Entry to Ms. Piper's property, 1/31/92. P. 200075-200075.

6. Letter to Mr. Ray Brabson from Mr. S. Andrew Sochanski, U.S. EPA, re: Consent for Access or Right of Entry to Mr. Brabson's property, 1/31/92. P. 200076-200076.

7. Letter to Ms. Viola Piper from Mr. S. Andrew Sochanski, U.S. EPA, re: The signed Consent for Access or Right of Entry to Ms. Piper's property, 1/31/92. P. 200077-200079. The Consent for Access is attached.

* Administrative Record File available 3/11/91, updated 3/27/92, 2/2/93, 10/18/93, and 4/11/96.

** Further information pertaining Limestone Road OU2 can be found in the Administrative Record File for Limestone Road OU1.

8. Letter to Mr. and Mrs. Ray Brabson from Mr. S. Andrew Sochanski, U.S. EPA, re: The signed Consent for Access or Right of Entry to the Brabson's property, 1/31/92. P. 200080-200082. The Consent for Access is attached.

9. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Clarification of requirements in the Consent Decree not being fulfilled, 2/18/92. P. 200083-200085.

10. Consent for Access to Property, signed by Mr. Donald R. Rose, 3/18/92. P. 200086-200088. A site map is attached.

11. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Notice of violation letter sent to Cumberland Cement and Supply and Fairchild Industries, Inc., 4/2/92. P. 200089-200090.

12. Letter to Mr. Philip M. Andrews, Kramon & Graham, from Mr. S. Andrew Sochanski, U.S. EPA, re: Non-compliance with the Consent Decree, 4/24/92. P. 200091-200092.

13. Letter to Mr. Philip M. Andrews, Kramon & Graham, from Mr. S. Andrew Sochanski, U.S. EPA, re: Non-compliance with the Consent Decree, 5/5/92. P. 200093-200094.

14. Letter to Ms. Cynthia Nadolski, U.S. EPA, from Mr. B. Michael Hodge, The Fairchild Corporation, re: Replacement of Mr. Tracy Getz of Winston & Strawn as counsel for Fairchild Industries, Inc., 10/1/92. P. 200095-200095.

III. REMEDIAL RESPONSE PLANNING

1. Report: Work Plan for the Supplemental Remedial Investigation/Feasibility Study (SRI/FS) and Remedial Design/Remedial Action (RD/RA) at the Limestone Road Site, Cumberland, Maryland, prepared by Geraghty and Miller, Inc., 5/88. P. 300001-300076.

2. National Priorities List (NPL) Site Certification, Limestone Road Site, Cumberland, Allegheny Co., Maryland, 4/21 to 22/90. P. 300077-300077.

3. Letter to Mr. Robert Davis, U.S. EPA, from Mr. John P. Wolflin, U.S. Department of the Interior (DOI), re: Site biological characterization, 7/13/90. P. 300078-300080. A map showing additional sampling locations is attached.

4. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. John P. Wolflin, U.S. DOI, re: Presence of endangered species at the site, 10/4/90. P. 300081-300082.

5. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. James Burtis, Jr., Maryland Department of Natural Resources, re: Presence of Federal or state threatened or endangered plant or wildlife species at the site, 10/12/90. P. 300083-300083.

6. Memorandum to Mr. Andrew Sochansky [sic], U.S. EPA, from Biological Technical Assistance Group (BTAG), re: Recommendations for Potentially Responsible Parties (PRPs) to carry out sampling and analysis suggestions, 12/20/90. P. 300084-300085. A letter regarding the U.S. DOI's review of the revised Field Sampling Plan is attached.

7. Report: Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, Draft Report, prepared by Geraghty & Miller, Inc., 6/90. P. 300086-300241. A cover letter is attached.

8. Report: Quality Assurance Project Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, Draft Report, prepared by Geraghty & Miller, Inc., 6/90. P. 300242-300552. (Pages 300251-300258 and 300452-300468 have been removed because they contain confidential information.)

9. Letter to Mr. Scott Phillips, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Initial review of the draft Field Sampling Plan (DFSP) and the draft Quality Assurance Project Plan (DQAPP) for the SRI/FS, 7/23/90. P. 300553-300584. The following are attached:

   a) Figure 3.1, Locations of Sampling Sites for the Supplemental Remedial Investigation;

   b) comments on the draft Field Sampling Plan;

   c) comments on the draft Quality Assurance Project Plan;

   d) comments on the Quality Assurance Project Plan Review.

10. Report: <u>Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, Revised Draft Report</u>, prepared by Geraghty & Miller, Inc., 8/90. P. 300585-300830. A cover letter and responses to EPA's review of the Field Sampling Plan are attached.

11. Report: <u>Revised Draft Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, Maryland</u>, prepared by Geraghty & Miller, Inc., 8/90. P. 300831-301059. A cover letter and a summary of responses to the draft Quality Assurance Project Plan are attached. (Pages 300862-300869 and 300932-300969 have been removed because they contain confidential information.)

12. Report: <u>Appendix B, Laboratory Quality Assurance Plan, Limestone Road RI/FS</u>, prepared by Geraghty & Miller, Inc., 8/28/90. P. 301060-301177. (Pages 301138-301148 and 301153-301158 have been removed because they contain confidential information.)

13. Letter to Mr. Scott Phillips, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Second review of the draft Field Sampling Plan and draft Quality Assurance Project Plan, 10/18/90. P. 301178-301197. EPA's responses to Geraghty & Miller's comments and an agenda for review of significant comments to the second draft of the Field Sampling Plan are attached.

14. Report: Revised Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, Draft Report, prepared by Geraghty & Miller, Inc., 11/90. P. 301198-301453. A cover letter and responses to EPA's October 1990 comments on the review of the Field Sampling Plan and the Quality Assurance Project Plan are attached.

15. Report: Revised Draft Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 11/90. P. 301454-301783. (Pages 301471-301478, 301541-301575, 301655-301665, and 301670-301675 have been removed because they contain confidential information.)

16. Report: Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 7/91. P. 301784-302067. Six letters and a non-potable water chemistry proficiency test report are attached.

17. Report: Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 7/91. P. 302068-302395. (Pages 302085-302092, 302157-302190, and 302270-302277 have been removed because they contain confidential information.)

18. Letter to Mr. Bob Byer, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Fourth review of the revised Field Sampling Plan and Quality Assurance Project Plan, 9/16/91. P. 302396-302400.

19. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert M. Byer, Jr., Mr. John E. Claypool, and Mr. Jeffrey P. Sgambat, Geraghty & Miller, Inc., re: Revised pages of the Field Sampling Plan and Quality Assurance Project Plan, 9/30/91. P. 302401-302452. Responses to EPA's September 1991 comments on the review of the Field Sampling Plan and Quality Assurance Project Plan and the revised pages of the plans are attached. (Pages 302436-302448 have been removed because they contain confidential information.)

20. Letter to Mr. S. Andrew Sochanski, Ms. Cynthia Nadolski, and Mr. David Healy, U.S. EPA, from Mr. Jeffrey P. Sgambat, Geraghty & Miller, Inc., re: Revised pages of the Field Sampling Plan and Quality Assurance Project Plan, 12/19/91. P. 302453-302492. The following are attached:

    a) a facsimile cover letter;

b) Attachment 1, Responses to EPA's November 20, 1991 Comments on the Review of the Field Sampling Plan and Quality Assurance Project Plan;

c) the revised pages of the Field Sampling Plan;

d) the revised pages of the Quality Assurance Project Plan.

21. Report: Health and Safety Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 9/90. P. 302493-302690.

22. Report: Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 12/91. P. 302691-302925.

23. Letter to Mr. Jeffery P. Sgambat, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the draft Field Sampling Plan and the Quality Assurance Project Plan, 1/17/92. P. 302926-302929. The review comments are attached.

24. Report: Revised Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 2/92. P. 302930-303238.

25. Letter to Mr. Tracy M. Getz, Winston & Strawn, and Mr. Philip M. Andrews, Kramon & Graham, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review and acceptance of the proposed substitute Prime Contractor for site work, 3/11/92. P. 303239-303240.

26. Letter to Ms. Cynthia Nadolski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Proposed sign locations, 3/17/92. P. 303241-303244. Two site maps showing approximate locations for signs are attached.

27. Report: Geophysical Investigation at the Limestone Road Site near Cumberland, Maryland, (no author cited), 4/92 to 6/92. P. 303245-303426.

28. Letter to Mr. David Kargbo, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Site inspection to review alternate borehole and monitoring well locations, 4/2/92. P. 303427-303429. A site map and a facsimile transmittal sheet are attached.

29. Report: Summary Report of Short Term Aquifer Testing Program and Long Term Aquifer Testing Proposal, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/92. P. 303430-303581.

30. Report: Geotechnical Testing Report, Limestone Road Site, Cumberland, Maryland, prepared by Empire Soils Investigations, Inc., 6/92. P. 303582-303643.

31. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Summary Report of Short Term Aquifer Testing Program and Long Term Aquifer Testing Proposal, 6/8/92. P. 303644-303648. The comments are attached.

32. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Responses to EPA's comments on the Summary Report of Short Term Aquifer Testing Program and Long Term Aquifer Testing Proposal, 6/8/92. P. 303649-303661. The responses are attached.

33. Memorandum to Ms. Carol Dunnigan from Ms. Doreen Carden, re: Analytical Data Quality Assessment and Validation of the surface soil cap area and soil borings investigation, 8/4/92. P. 30662-30703. The following are attached:

    a) Table 1, Analytical Results, Fill Sample Program;

    b) Table 2, Analytical Results, Soil Fill Boreholes;

    c) Table 3, Summary of Sample Collection and Analytical Programs;

    d) Table 4, Qualification of Data due to Outlying Internal Standard Area Counts;

    e) Table 5, Qualified Sample Data due to Field Duplicated Discrepancies, Soil Borings;

    f) Table 6, Qualification of Data due to Outlying Matrix Spike Recoveries;

    g) Table 7, Qualified Sample Data due to Field Duplicated Discrepancies, Soil Fill.

34. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Summary of EPA's and Maryland Department of the Environment's position on the RI/FS work tasks, 8/6/92. P. 303704-303706.

35. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Response to clarify Conestoga-Rovers' understanding of the progress of site work, 8/12/92. P. 303706-303709.

36. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Clarification of issues concerning the Long Term Aquifer Testing Program, 9/4/92. P. 303710-303712.

37. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Geotechnical Testing Report, the Geophysical Investigation Report, and the Analytical Data Quality Assessment and Validation, 9/11/92. P. 303713-303716. The comments are attached.

38. Letter to Mr. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Proposed changes to the Long Term Aquifer Testing Program, 9/22/92. P. 303717-303725. Three graphs are attached.

39. Letter to Mr. S.A. Sochanski, U.S. EPA, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Clarification of sampling results, 10/15/92. P. 303726-303730. A table of Surface Fill Soil Samples and a site map are attached.

40. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: The Long Term Aquifer Testing Program, 10/24/92. P. 303731-303735.

41. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Installation of additional monitoring wells and scheduling of field activities for the Supplemental Remedial Investigation, 11/13/92. P. 303736-303740. Two revised RI/FS schedules are attached.

42. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Analytical Quality Assessment and Validation, 11/16/92. P. 303741-303743. The comments are attached.

43. Letter to Mr. Jeffery P. Sgambat, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Discovery of bullet holes in monitoring well casings, 7/3/91. P. 303744-303745.

44. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Response to the letter concerning bullet holes found in monitoring well casings, 7/22/91. P. 303746-303747.

45. Letter to Mr. Phil Andrews, Kramon & Graham, from Ms. Cynthia Nadolski, U.S. EPA, re: Signs to be posted at the site to deter unrestricted access, 9/24/91. P. 303748-303749.

46. Report: Remedial Investigation Risk Assessment Work Plan, Limestone Road Site, Cumberland, Maryland, prepared by Dynamac Corporation, 3/31/92. P. 303750-303787. A cover letter is attached.

47. Report: Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, prepared by Conestoga-Rovers & Associates, 7/8/92. P. 303788-303866.

48. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Results of fill material sampling, 8/12/92. P. 303867-303868.

49. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Acceptance of the schedule for additional monitoring well installation, 12/14/92. P. 303869-303870.

50. Report: Supplemental Remedial Investigation, Long-Term Pumping Test Results and Additional Monitoring Well Proposal, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 1/29/93. P. 303871-304193. A cover letter is attached.

51. Report: Attachment 1, Supplemental Remedial Investigation, Long-Term Pumping Test Results and Additional Monitoring Well Proposal, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 1/29/93. P. 304194-304392.

52. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Request for a meeting to resolve differences concerning the expansion of activities beyond site limits, 2/1/93. P. 304393-304401. A letter dated January 21, 1993 regarding the third round surface soil sampling and six site maps are attached.

53. Report: Residential Well Sampling Proposal, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 2/5/93. P. 304402-304432. A cover letter is attached.

54. Letter to Mr. Camille Costa, Dynamac Corporation, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the revised Ecological Risk Assessment Work Plan, 2/8/93. P. 304433-304433.

55. Letter to Director of Public Works, City of Cumberland, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Request for permission to discharge to the city wastewater treatment facility, 2/9/93. P. 304434-304458. A table of stored ground water sampling results and an analytical report of sampling results are attached.

56. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Long Term Pumping Test Results and Additional Monitoring Well Proposal and the Geophysical Survey Report, 2/16/93. P. 304459-304474. The comments are attached.

57. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Results of the reanalysis of archived fill samples and a change to be made to the analysis method for cadmium, 2/18/93. P. 304475-304493. The following are attached:

a) Figure 1, Perimeter Fill Material Analytical Data Summary;

b) a table of Surface Fill Soil Samples;

c) a memorandum regarding the assessment and validation of analytical results, dated February 9, 1993;

d) Table 1, Analytical Data, Cadmium Reanalysis;

e) Table 2, Qualified Data due to Outlying Matrix Spike Recoveries, Cadmium Reanalysis;

f) Table 3, Qualified Sample Data due to Outlying MSA Correlation Coefficients, Cadmium Reanalysis;

g) Table 4, Field Duplicate Results and Qualified Sample Data, Cadmium Reanalysis;

h) Table 5, Sample Data Discrepancies, Cadmium Reanalysis.

58. Report: Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, Soil Samples (13), prepared by Conestoga-Rovers & Associates, 3/4/93. P. 304494-304515.

59. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Notification of a change in Project Coordinator for Conestoga-Rovers & Associates, 3/4/93. P. 304516-304525. The resume of Mr. Jack J.A. Michels is attached.

60. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Residential Well Sampling Proposal, 3/4/93. P. 304526-304533. The comments are attached.

61. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Andrew P. Kisiel, Conestoga-Rovers & Associates, re: Specifications for well construction details, 3/5/93. P. 304534-304535.

62. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Michael G. Mateyk, Conestoga-Rovers & Associates, re: Response to EPA's and Maryland Department of the Environment's comments on the Additional Monitoring Well Proposal, 3/9/93. P. 304536-304554. The responses are attached.

63. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, re: Request for an extension to submit the Remedial Design Plan, 3/12/93. P. 304555-304555.

64. Memorandum to Mr. Frederick Dreisch from Behrooz Khoshkhoo, Lockheed Environmental Systems & Technologies Co., re: Total hexavalent chromium determinations, 3/22/93. P. 304556-304559.

65. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Michael G. Mateyk, Conestoga-Rovers & Associates, re: Response to EPA's and Maryland Department of the Environment's comments on the Residential Well Sampling Proposal, 3/24/93. P. 304560-304572. The responses are attached.

66. Memorandum to Mr. Frederick Dreisch from Ms. Linda D. Vaughan, Lockheed Environmental Systems & Technologies Co., re: Determination of pH in soil samples, 3/26/93. P. 304573-304574.

67. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Acceptance of the request for an extension to submit the Remedial Design Work Plan, 3/31/93. P. 304575-304576.

68. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, form Mr. S. Andrew Sochanski, U.S. EPA, re: Acceptance of Mr. Michels as the new Project Coordinator for Conestoga-Rovers & Associates, 3/31/93. P. 304577-304578.

69. Report: Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, Soil Fill Samples (10), prepared by Conestoga-Rovers & Associates, 4/93. P. 304579-304597.

70. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the Residential Well Sampling Proposal and the Long Term Pumping Test Results and Additional Monitoring Well Proposal, 4/7/93. P. 304598-304600.

71. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Design specifications, 4/8/93. P. 304601-304603. A Remedial Design Specifications and Plans Distribution List is attached.

72. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Response to EPA's comments on the Residential Well Sampling Proposal, 4/13/93. P. 304604-304606. A table of residential wells sampled is attached.

73. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Request for a sample key, 4/15/93. P. 304607-304607.

74. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Residential well sampling efforts, 4/15/93. P. 304608-304611. Two lists of residential wells to be sampled are attached.

75. Report: Trip Report for Enforcement Sampling at the Limestone Road Site, Cumberland, Maryland, prepared by Dynamac Corporation, 4/16/93. P. 304612-304662. A cover letter is attached.

76. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Request for permission to discharge ground water, 4/22/93. P. 304663-304669. A stored ground water analysis table and ground water sampling results are attached.

77. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Request for a meeting to discuss the Long Term Monitoring Well Proposal, the Additional Monitoring Well Installation, and the Residential Well Sampling Proposal, 4/26/93. P. 304670-304671.

77. Letter to Mr. Burly Cunningham from Mr. S. Andrew Sochanski, U.S. EPA, re: Request for vehicles and other salvage material to be removed from the Diggs property, 4/27/93. P. 304672-304673.

79. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: EPA's contesting of a dispute resolution claim and information on the residential well sampling, 4/27/93. P. 304674-304675.

80. Report: Limestone Road, Superfund Enforcement Account No. TGB03N663, REQ 9300067, prepared by U.S. EPA, 4/28/93. P. 304676-304697.

81. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Results of the filtered and unfiltered ground and surface water sampling, 4/30/93. P. 304698-304699.

82. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Denial of a request to dispose of ground water on-site, 5/4/93. P. 304700-304700.

83. Report: Analytical Report, Project Number 4550, prepared by Enesco-Wadsworth/Alert Laboratories, 5/12/93. P. 304701-304738.

84. Report: Remedial Design Plan, Limestone Road, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 304739-304990.

85. Report: Health and Safety Plan, Interim Remedial Action, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 304991-305083.

86. Report: Operation and Maintenance Plan, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305084-305101.

87. Report: Interim Remedial Program Project Specifications, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305102-305231.

88. Report: Construction Quality Assurance Project Plan, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305232-305261.

89. Report: Evaluation of Total Versus Dissolved Constituent Concentrations, Supplemental Remedial Investigation/Feasibility Study, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305262-305382. A cover letter is attached.

90. Report: Trip Report for Enforcement Sampling at the Limestone Road Site, Cumberland, Maryland, prepared by Dynamac Corporation, 5/17/93. P. 305383-305406. A cover letter is attached.

91. Report: Evaluation of Total Versus Dissolved Constituent Concentrations, Supplemental Remedial Investigation/Feasibility Study, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/28/93. P. 305407-305466. A cover letter is attached.

92. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Need for collection of additional geophysical data, 6/1/93. P. 305467-305468.

93. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Notice that Fairchild Industries will not perform additional geophysical data collection, 6/7/93. P. 305469-305469.

94. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the Total Versus Dissolved Metals Residential Well Sampling, 6/7/93. P. 305470-305471.

95. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Additional residential well sampling, 6/10/93. P. 305472-305474. The sampling results are attached.

96. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Revision of the capping boundaries, 6/11/93. P. 304575-305481. Surface fill sampling results are attached.

97. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Remedial Design Plan, the Project Specifications, the Construction Quality Assurance Project Plan, the Operation and Maintenance Plan, and the Health and Safety Plan, 6/16/93. P. 305482-305528. The comments are attached.

98. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Operation and Maintenance Plan, 6/17/93. P. 305529-305530. The comments are attached.

99. Report: <u>Trip Report for Enforcement Sampling at the Limestone Road Site, Cumberland, Maryland</u>, prepared by Dynamac Corporation, 6/17/93. P. 305531-305558. A cover letter is attached.

100. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Notice that Cumberland Cement and Supply Company will not perform additional work, 6/17/93. P. 305559-305559.

101. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Andrew P. Kisiel, Conestoga-Rovers & Associates, re: A field audit conducted on May 20, 1993 to verify that sampling was being performed according to the Work Plan, 6/17/93. P. 305560-305568. A memorandum dated June 14, 1993 regarding the field audit and a field audit summary form are attached.

102. Memorandum to Mr. Gregg Crystall, U.S. EPA, from Ms. Marian Murphy, Roy F. Weston, Inc., re: Analytical review of five water samples, 6/22/93. P. 305569-305584.

103. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Steven C. Day, Conestoga-Rovers & Associates, re: A laboratory audit conducted on May 27, 1993 to verify that analyses were being performed according to the Work Plan, 6/24/93. P. 305585-305664. A memorandum dated June 23, 1993 regarding the laboratory audit, the Audit Checklist, and Performance Evaluation Results are attached.

104. Special Bulletin A to Regional Response Center, Region III, U.S. EPA, from Mr. George English, U.S. EPA, re: Notification of a $50,000 activation, 7/1/93. P. 305665-305667.

105. Letter to Mr. S. Andrew Sochanski and Ms. Cynthia Nadolski, U.S. EPA, and Mr. David Healy, Maryland Department of the Environment, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: The April 1993 Analytical Data Quality Assessment and Validation report, 7/7/93. P. 305668-305687. The report is attached.

106. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Wayne H. Sonntag, U.S. DOI, re: The U.S. Geological Survey Work Plan for povision of technical support, 7/7/93. P. 305688-305735. The Work Plan and the Scope of Work for Borehole Geophysical Logging and Interpretation are attached.

107. Memorandum to Mr. Andy Sochanski, U.S. EPA, from Ms. Cynthia E. Caporale, U.S. EPA, re: Organic Data Validation for Case 20107/7571HQ, 7/14/93. P. 305736-305745. The Organic Data Validation for Case 20107/7571HQ; Appendix A, Glossary of Data Qualifiers; and Appendix B, Data Summary Forms, are attached.

108. Report: <u>Limestone Road, Superfund Enforcement Account No. 3TGB03N663, REQ 9306</u>, prepared by U.S. EPA, 7/21/93. P. 305746-305752.

109. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Response to comments on the Remedial Design Plan, 7/21/93. P. 305753-305808. The response is attached.

110. Facsimile transmittal sheet to Mr. Andrew Sochanski, U.S. EPA, from J. Kozel, Dynamac Corporation, re: Summary tables for residential well sampling, 7/28/93. P. 305809-305812. The tables are attached.

111. Report: <u>Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, Groundwater Investigation Round I, Surface Water/Sediment Investigation Round I, Residential Well Sampling Round I</u>, prepared by Conestoga-Rovers & Associates, 7/28/93. P. 305813-305880. A cover letter is attached.

112. Report: <u>Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, Groundwater Investigation Round II, Surface Water/Sediment Investigation Round II, Residential Well Sampling Round II</u>, prepared by Conestoga-Rovers & Associates, 7/28/93. P. 305881-305946.

113. Memorandum to Mr. Andy Sochanski, U.S. EPA, from Ms. Cynthia E. Caporale, U.S. EPA, re: Inorganic Data Validation for Case SAS 7865C-03, 8/2/93. P. 305947-305965. The following are attached:

a) the Inorganic Data Validation for Case SAS 7865C-03;

b) Table 1, Data Summary Form;

c) Table 2, Glossary of Data Qualifier Codes;

d) four Special Analytical Service Packing List/ Chain of Custody forms;

e) three EPA Sample Shipping Logs.

114. Memorandum to Mr. Andy Sochanski, U.S. EPA, from Ms. Cynthia E. Caporale, U.S. EPA, re: Inorganic Data Validation for Case SAS 7908C-02, 8/10/93. P. 305966-305981. The following are attached:

a) the Inorganic Data Validation for Case SAS 7908C-02;

b) Table 1A, Summary of Qualifiers on Data Summary After Data Validation;

c) Table 1B, Codes Used in Comments Column;

d) Table 2, Glossary of Data Qualifier Codes;

e) Table 3, Summary of Sample Locations and Associated EPA Sample Numbers;

f) Appendix A, Results Reported by Laboratory Form Inorganics (Is);

g) two Special Analytical Service Packing List/ Chain of Custody forms;

e) two EPA Sample Shipping Logs.

115. Report: Phase I Ecological Assessment Supplemental Remedial Investigation, prepared by Conestoga-Rovers & Associates, 9/94. P. 305982-306102.

116. Letter to Mr. Gerald Hoover, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Supplemental information for the ecological risk assessment for the site, 1/13/95. P. 306103-306111.

117. Letter to Mr. Gerald Hoover, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Supplemental information concerning the ecological risk assessment, 1/16/95. P. 306112-306116. A list of flora and fauna at the site is attached.

118. Letter to Mr. Gerald Hoover, U.S. EPA, from Mr. Christopher Bozzini, CH2M Hill, re: Comments concerning the supplemental ecological risk assessment information submitted by Conestoga-Rovers & Associates, 2/6/95. P. 306117-306119.

119. Memorandum to Mr. Gerald Hoover, U.S. EPA, from Mr. Robert S. Davis, U.S. EPA, re: Biological Technical Assistance Group's (BTAG) comments concerning the supplemental ecological risk assessment information submitted by Conestoga-Rovers & Associates, 2/6/95. P. 306120-306122.

120. Memorandum to Mr. Gerald Hoover, U.S. EPA, from Mr. Robert S. Davis, U.S. EPA, re: Comments concerning the supplemental ecological risk assessment information submitted by Conestoga-Rovers & Associates, 2/10/95. P. 306123-306125.

121. Report: Final Remedial Investigation Report, Volume I Text and Appendices, prepared by Conestoga-Rovers & Associates, 3/95. P. 306126-307152. A transmittal letter is attached.

122. Report: <u>Final Supplemental Feasibility Study</u>, prepared by Conestoga-Rovers & Associates, 4/95. P. 307153-307359.

123. U.S. EPA Summary of Environmental Risk Assessment, Limestone Road Superfund Site, 4/10/95. P. 307360-307367. A facsimile transmittal is attached.

124. Memorandum to Mr. Gerald Hoover, U.S. EPA, from Mr. Robert S. Davis, U.S. EPA, re: Comments concerning the ecological risk assessment, 4/26/95. P. 307368-307369.

125. Letter to Mr. Glen S. Lapsley, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Summary of the results of the residential well monitoring program and proposed changes in the program, 11/17/95. P. 307370-307422. A letter providing EPA's conditional approval to changes in the residential well monitoring program, a summary of the statistical methodology used by Conestoga-Rovers & Associates, and the analytical results and comparison statistics for the monitoring program are attached.

126. Report: <u>Interim Remedial Action Operation and Maintenance and Interim Monitoring Program</u>, prepared by Conestoga-Rovers & Associates, 1/96. P. 307423-307587.

127. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Ms. Lesley Brunker, U.S. EPA, re: Conditional approval of the final supplemental feasibility study for the site, 2/14/96. P. 307588-307589.

128. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Rick Grills, Maryland Department of the Environment (MDE), re: Approval of the draft proposed plan for the site and notification that the state has no comments concerning this document, 2/29/96. P. 307590-307590.

129. Memorandum to Ms. Lesley Brunker, U.S. EPA, from Mr. Robert S. Davis, U.S. EPA, re: BTAG's comments concerning the draft proposed plan, 3/6/96. P. 307591-307592.

130. Memorandum to Ms. Lesley Brunker, U.S. EPA, from Mr. Roy Smith, U.S. EPA, re: Comments concerning the proposed plan, 3/11/96. P. 307593-307593.

131. Memorandum to the site file, from Mr. Lesley Brunker, re: Revised risk calculations based on changes in the reference dose for manganese, 3/20/96. P. 307594-307594.

132. Proposed Plan, Limestone Road OU2 Site, 4/96. P. 307595-307611.

133. Letter to Ms. Lesley Brunker, U.S. EPA, from Dr. Jane A. Fiscus, Allegheny County Health Department, re: Notification of the Allegheny County Health Department's support of EPA Alternative 3 for the Limestone Road Site, 4/26/96. P.

134. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Ronald K. Snyder, Allegheny County Department of Public Works, re: Recommendation that Allegheny County, rather than the PRPs, provide a water supply to the Limestone Road Site, 5/10/96. P.

135. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Jack Michels, Constega-Rovers & Associates, re: Transmittal of comments regarding EPA's Propsed Plan for the Limestone Road OU2 Site on behalf of the PRPs, 5/13/96. P.

136. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Rick Grills, Maryland Department of the Environment (MDE), re: Notification that MDE has no comments regarding the draft Record of Decision (ROD) for the Limestone Road OU2 Site, 6/12/96. P.

V. <u>COMMUNITY RELATIONS/CONGRESSIONAL CORRESPONDENCE/IMAGERY</u>

137. U.S. EPA Fact Sheet, Limestone Road Site, 4/93. P. 500001-500004.

138. Minutes of a public meeting held on April 24, 1996, in the District 16 Fire Hall, 12100 North Branch Road, Cumberland, Maryland, to discuss the proposed plan for the Limestone Road Site, 4/24/96. P.